

Callide Power Station – Addendum Contaminated Land Investigation Document (Site Investigation)

CS Energy Limited
Callide Power Station - PFAS Investigation
Callide Power Station
BC200153.03

CONTENTS

Executive Summary **8**

1 Introduction **12**

1.1 EE Requirements 13

1.2 Data Gaps and CLID Recommendations 16

1.3 Roles and Responsibilities 19

2 Site Description and Background **20**

2.1 Site Identification 20

2.2 Environmental Management Register 21

2.3 Site History, Layout, Background and Previous Investigations 22

3 Data Quality Objectives (DQOs) **23**

4 Assessment Criteria **24**

4.1 Groundwater and Surface Water Assessment Criteria 24

4.2 Soil and Sediment Assessment Criteria 24

5 Methodology **26**

5.1 Groundwater and Surface Water Sampling Schedule 26

5.2 Soil Sampling Methodology 27

5.3 Sediment Sampling Methodology 28

5.4 Surface Water Sampling Methodology 28

5.5 Groundwater Sampling Methodology 29

6 Ash Dam 4 (Data Gap 1) **32**

6.1 AD4 Investigation Scope 39

6.1.1 Deviations from the Addendum SAQP 40

6.1.2 Field QA/QC 40

6.2 AD4 Observations and Analytical Results 40

6.3 AD4 Results Discussion 42

7 Callide A (Data Gaps 2 and 3) **43**

7.1 Callide A Investigation Scope 46

7.1.1 Deviations from the Addendum SAQP 47

7.1.2 Field QA/QC 48

7.2 Observations and Analytical Results 48

7.3 Callide A Results Discussion 52

8 Eastern Seepage Areas (Data Gap 4) **56**

8.1 Eastern Seepage Areas Investigation Scope 59

8.1.1 Deviations from the Addendum SAQP 59

8.1.2 Field QA/QC 59

8.2 Groundwater Analytical Results 59

8.3 Eastern Seepage Area Results Discussion 62

9 Western Seepage Area (Data Gap 5) 65
9.1 Western Seepage Areas Investigation Scope 67
9.1.1 Deviations from the Addendum SAQP 67
9.1.2 Field QA/QC 67
9.2 Groundwater Analytical Results 67
9.3 Western Seepage Area Results Discussion 70
10 Northern Boundary (Data Gap 6) 73
10.1 Northern Boundary Investigation Scope 74
10.1.1 Deviations from the Addendum SAQP 75
10.1.2 Field QA/QC 75
10.2 Surface Water and Groundwater Analytical Results 75
10.3 Northern Boundary Results Discussion 78
10.4 Northern Boundary Flow Monitoring 81
11 Aquatic Biota (Data Gap 7) 84
11.1 Aquatic Biota Investigation Scope 84
11.2 Investigation Results and Discussion 85
11.3 Aquatic Biota Results Discussion 87
11.3.1 Potential Human Health Risks 89
11.3.2 Potential Ecological Risks 89
12 Soil Remediation (Fire Training Ground and Fuel Oil Tanks) 90
12.1 Soil Remediation Validation Scope 93
12.2 Soil Remediation Validation Analytical Results 93
12.2.1 Treatment Validation Samples 93
12.2.2 Excavation Validation Results 94
12.3 Soil Remediation Discussion 94
13 Groundwater and Surface Water Monitoring (Quarterly) 96
13.1 Groundwater Standing Water Levels 96
13.2 Quarterly Monitoring Analytical Results 96
14 Additional Investigations 103
14.1 Bore Drilling and Well Installation (GHD, 2023) 104
14.1.1 Data Reliability and Review 107
14.2 Interpretative Hydrogeological Review (EMS, 2024) 108
14.3 Eastern Diversion Channel (EDC) 111
14.3.1 Eastern Diversion Channel Discussion 112
15 Revised Conceptual Site Model 114
15.1 Review of Source-Pathway-Receptor Model 117
15.2 Human Health Risks 123
15.3 Ecological Risks 123
16 Conclusions and Recommendations 125

16.1 Conclusions 125
16.2 Remaining Data Gaps 125
16.3 Recommendations 126
16.4 Site Suitability Statement 127
17 References 129
18 Acronyms 131

LIST OF FIGURES

Body Report

Figure 1. General Site Layout (source: Queensland Government 2024) 21
Figure 2. Coal Plant and AD4 – PFAS Concentration in Sediment (Epic, 2022c) 33
Figure 3. AD4 – PFAS Concentration in Sediments (AD4-1 to AD-3) and Soils (AD401 to AD414) 42
Figure 4. Callide A and Dunn Creek – PFAS Composition in Surface Water (Epic, 2022c) 45
Figure 5. Callide A and Dunn Creek – PFAS Concentration in Surface Water (Epic, 2022c) 45
Figure 6. Callide A Surface Water – PFOS Concentrations 53
Figure 7. Callide A – PFAS Composition in Surface Water (SW43, SW44, R2, Coal Hopper), Groundwater (MW97), Sediments (NSP) and Soils (CA04, CA10, CA15, CA18, CA-SS01 to SS04) 54
Figure 8. Callide A – Piper Diagram for Surface Water (SW44, R2) and Groundwater (MW97) 55
Figure 8. Eastern Seepage Area – PFAS Composition in Groundwater (Epic, 2022c) 57
Figure 8. Eastern Seepage Area – PFAS Concentrations in Groundwater (Epic, 2022c) 57
Figure 9. ESC3 Time Series Plot (Epic, 2022c) 58
Figure 10. MW32 Time Series Plot (Epic, 2022c) 58
Figure 11. Eastern Seepage Area – PFAS Composition in Groundwater (Long Seepage Pathway) 63
Figure 12. Eastern Seepage Area – PFAS Concentration (Long Seepage Pathway) 64
Figure 13. Western Seepage Area – PFAS Composition in Groundwater (Epic, 2022c) 66
Figure 14. Western Seepage Area – PFAS Concentration in Groundwater (Epic, 2022c) 66
Figure 15. MW49 PFAS Concentration Trend 70
Figure 16. Western Seepage Area PFAS Composition in Groundwater 71
Figure 17. Western Seepage Area PFAS Concentrations in Groundwater 72
Figure 18. MW74 and SW34 – PFAS Composition in Groundwater (MW74) and Surface Water (SW34)(Epic, 2022c) 74
Figure 19. Total PFAS Concentrations – MW74 and SW34 (Epic, 2022c) 74
Figure 20. MW74 and SW34 – PFAS Composition in Groundwater (MW74) and Surface Water (MW34) 79
Figure 21. MW74 and SW34 – PFAS Concentration 80
Figure 22. Total PFAS Concentration Trend – MW74 and SW34 80
Figure 23. Northern Boundary Sensor Example Output 82
Figure 24. PFOS Concentrations in Aquatic Biota vs Surface Water 88
Figure 25. Fire Training Ground Soil Leachate Comparison (Epic, 2022c) 91
Figure 26. Fuel Oil Tanks Soil Leachate Comparison (Epic, 2022c) 92
Figure 27. Eastern Seepage Area Groundwater Contours (October 2023) (EMS, 2024) 109
Figure 28. Western Seepage Area Groundwater Contours (August 2023) (EMS, 2024) 110

Figure Section

Figure F1. Site Features and Layout
Figure F2. Groundwater Monitoring Locations
Figure F3. Surface Water Monitoring Locations
Figure F4. Ash Dam 4 Investigation Locations
Figure F5. Callide A Investigation Locations
Figure F6. Eastern Seepage Area

Figure F7. Western Seepage Area
Figure F8. Northern Boundary and Dunn Creek Monitoring Locations
Figure F9. Aquatic Biota Investigation Locations
Figure F10. Soil Validation Samples – Fuel Oil Tanks
Figure F11. Soil Validation Samples – Fire Training Ground
Figure F12. Long-term Concentration Trend – Callide Creek

LIST OF PLATES

Plate Section

Plate P1. Groundwater Bore MW57 looking East
Plate P2. Groundwater Bore MW76 looking East
Plate P3. View of the Drains Reclaim Dam (DRD)
Plate P4. View of PW1
Plate P5. View of surface water location PW2 with Ash Dam B
Plate P6. View of the Western Seepage Collection Pond and Pump
Plate P7. View of SW28 monitoring location
Plate P8. View of BS3 Monitoring Location
Plate P9. View of SW34
Plate P10. View of SW33
Plate P11. View of SW37
Plate P12. View of Release Point R2 at Callide A
Plate P13. View of Callide A Eastern Stormwater Pond
Plate P14. View of Callide A Northern Stormwater Pond
Plate P15. View of the soil profile encountered in soil bore CA15
Plate P16. View of Callide A
Plate P17. View of the Fuel Oil Tanks
Plate P18. View of the Fire Training Ground
Plate P19. View of the Fire Station
Plate P20. View of Ash Dam 4
Plate P21. View of the perimeter drain at the Coal Plant

LIST OF TABLES

Body Report

Table 1. Summary of Remaining Data Gaps and Recommendations 9
Table 2. Summary of, and Assessment against EE E-100046349 Requirements (DES, 2023) 13
Table 3. Data Gaps and CLID Recommendations presented in initial CLID (Epic, 2022c) 17
Table 4. Key Roles 19
Table 5. Site Identification 20
Table 6. Adopted Groundwater and Surface Water Assessment Criteria 24
Table 7. Adopted Soil and Sediment Assessment Criteria 25
Table 8. Groundwater and Surface Water Monitoring Program 26
Table 9. Soil Sampling Methodology 27
Table 10. Soil Sampling Methodology 28
Table 11. Surface Water Sampling Methodology 28
Table 12. Groundwater Sampling Methodology 29
Table 13. Ash Dam 4 (Data Gap 1) Summary 32
Table 14. Historical Aerial Review: AD4 34
Table 15. AD4 Additional Soil Investigation Scope 39
Table 16. AD4 Soil Investigation Results Summary 41
Table 17. Callide A (Data Gap 2 and 3) Summary 43

Table 18. Callide A Additional Investigation Scope....46
Table 19. Callide A Ash Dam 2 Groundwater Bore Summary....47
Table 19. Callide A Investigation Results Summary....49
Table 20. Eastern Seepage Areas (Data Gap 4) Summary....56
Table 21. Eastern Seepage Areas Additional Investigation Scope....59
Table 22. Eastern Seepage Area Investigation Results Summary....60
Table 23. Western Seepage Area (Data Gap 5) Summary....65
Table 24. Western Seepage Areas Additional Investigation Scope....67
Table 25. Western Seepage Area Investigation Results Summary....68
Table 26. Northern Boundary (Data Gap 5) Summary....73
Table 27. Northern Boundary Additional Investigation Scope....75
Table 28. Northern Boundary Investigation Results Summary....76
Table 29. Northern Boundary Surface Water Statistical Analysis....78
Table 30. Aquatic Biota (Data Gap 7) Summary....84
Table 31. Selected Target Species (Epic, 2022c, Appendix E)....84
Table 32. Summary of Aquatic Biota Investigation Results....86
Table 34. Soil Remediation Summary....90
Table 34. Treatment Validation Verification Results....94
Table 35. Summary of Soil Analytical Results for PFOS & PFHxS by Area (Site Remediation Criteria)....94
Table 36. Estimated Mass of PFAS Chemically Stabilised....95
Table 37. Groundwater and Surface Water Monitoring Results Summary....98
Table 38. Event Based Sampling Events....101
Table 39. Summary of Additional Investigation Scopes....103
Table 40. Document Review: GHD Bore Drilling and Well Installation (GHD, 2023a, b & c)....104
Table 41. Summary of Recovery and Monitoring Bores (GHD, 2023a)....105
Table 42. Summary of Slug Test Results (GHD, 2023a)....105
Table 43. Summary of Pumping Test Results (GHD, 2023a)....106
Table 44. Document Review – Callide P.S. PFAS Environmental Evaluation, Groundwater Investigation, January 2024 (EMS, 2024)....108
Table 45. ADB Groundwater Flux and Recovery (EMS,2024)....111
Table 46. Eastern Diversion Channel Results Summary....111
Table 47. Revised CSM Aspects....114
Table 49. Summary of Revised Pathway and Receptor Linkages....118

Tables Section

Table T1. Groundwater and Surface Water Field Parameters
Table T2. Groundwater and Surface Water Analytical Results - PFAS
Table T3. Groundwater and Surface Water Analytical Results - Physico-Chemical, Cations & Anions
Table T4. Sediment Analytical Results - PFAS
Table T5. Soil Ash Analytical Results - PFAS
Table T6. Soil, Sediment and Ash Leachate Results
Table T7. Leachate Comparison
Table T8. PFAS Analytical Results Quality Assurance Review - Water Samples
Table T9. PFAS Analytical Results Quality Assurance Review - Solid Samples
Table T10. Soil Remediation and Validation Analytical Results
Table T11. Soil Remediation and Validation Analytical Results - Leachate

LIST OF APPENDICES

Appendix A SQP Documentation

Appendix B EE Notice

Appendix C EMR Search Results
Appendix D CS Energy Monitoring Locations
Appendix E Conceptual Site model
Appendix F DQOs and QA/QC Discussion
Appendix G Field Sheets
Appendix H Calibration Certificates
Appendix I Bore Logs
Appendix J Groundwater Bore Development Sheets
Appendix K Laboratory Certificates
Appendix L Addendum SAQP (Epic, 2023a)
Appendix M Callide Power Station Ecological Report (Hydrobiology, 2023)
Appendix N Geophysical Resistivity Survey Report (Fender Geophysics, 2023)
Appendix O GHD Bore Installation and Sampling Reports (GHD, 2023)
Appendix P EnviroPacific Remediation DOcumentation
Appendix Q Soil Remediation and Validation Analytical Results
Appendix R Statistical Analysis Results
Appendix S Northern Boundary Sensor Data

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EXECUTIVE SUMMARY

CS Energy Limited (CS Energy) operates the Callide Power Station (the site or the station), located approximately nine km north-east of Biloela, Queensland. Aqueous film forming foams (AFFF) containing per- and poly-fluoroalkyl substances (PFAS) have been used historically over the life of the station. Removal of all non-compliant AFFF commenced in late 2018, with all non-compliant AFFF removed from service and disposed to a licensed disposal facility prior to 2019.

Historical information available identifies that potential onsite releases (use) of AFFF at the Callide B and C Power Station site is likely to be less than 1,000L over the life of the station, including use of up to 300L of AFFF concentrate in training activities, system tests and use/maintenance of extinguishers, and a further approximately 500L of AFFF concentrate used in emergency response associated with coal fires at the coal plant. It is noted that a number of events are reported to have been fully contained within onsite bunding and cleaned up by licenced contractors. Limited information was available for use of AFFF at the Callide A Power Station site, which operated between 1965 and 1988. By comparison, the Oakey Army Aviation Centre is reported to have released approximately 1.2 million litres of AFFF concentrate over 25 years of operation[1].

In conjunction with the removal of non-compliant AFFF, CS Energy committed to the Department of Environment and Science (DES, now the Department of Environment, Science and Innovation (DESI)) to undertake a voluntary PFAS Environmental Investigation, to assess potential impacts associated with the former use of PFAS-containing products at the site. Epic Environmental (Epic) was engaged by CS Energy as their suitably qualified person (SQP) to undertake assessment of PFAS at the site as part of this voluntary investigation. Under the voluntary arrangement, CS Energy also submitted an initial monitoring plan to DES and continued to operate in accordance with it.

Initial investigations completed at the site in 2019 targeted existing onsite and offsite groundwater and surface water monitoring locations, with the investigation expanded during 2021 to include sampling of private groundwater supply wells up to 12 km downstream of the site. To date, a total of 158 groundwater monitoring bores and 50 surface water monitoring locations have been sampled. Results from monitoring completed to date report concentrations of the Sum of PFOS and PFHxS above the Australian Drinking Water Guideline (0.07 µg/L) in onsite and offsite groundwater monitoring wells (Sum of PFOS and PFHxS up to 33.50 µg/L and 6.59 µg/L respectively) and onsite and offsite surface water (Sum of PFOS and PFHxS up to 0.595 µg/L and 0.0887 µg/L respectively). All results from sampling completed to date have been provided to DES, Queensland Health, the Department of Agriculture and fisheries (DAF), and the Contaminated Land Auditor (CLA). CS Energy has also provided results to relevant private landholders.

On 15 December 2021, a Notice to conduct or commission an Environmental Evaluation (EE) notice (Reference: EPPR00536313 | CCPLRC-100046232 | E-100046349)(DES, 2021) was formally issued by DES to CS Energy. This notice required CS Energy to commission an environmental investigation to determine the nature and extent of impact arising from any direct or indirect release of PFAS from the historical use of AFFF at the site.

In accordance with Requirement 5 of the EE, a Contaminated Land Investigation Document (CLID), comprising a site investigation report, was submitted to DES on 7 September 2022. The CLID comprised the following report:

- *Callide Power Station – Contaminated Land Investigation Document (Site Investigation), 7 September 2022 (Epic 2022c)*

Following submission of the CLID, a meeting was held with DES to discuss the seven remaining data gaps detailed in the CLID (data gaps 1 to 7) and agree on a timeframe to complete additional investigation required to address the data gaps. Correspondence received by DES on 4 October 2022 (DES, 2022b) requested CS Energy complete additional works and provide an addendum CLID report to satisfy the Requirement 8 of the amended EE (DES, 2023). A further time extension was granted on 21 August 2023 to complete the additional works, with the final requirement as follows:

[1] Environmental Management of Fire Fighting Foam Policy, Explanatory Notes (Revision 2.2). Department of Environment and Heritage Protection (now DES), July 2016.

Requirement 8: *By 5:00 pm on 8 March 2024 you must submit a final environmental report to department that demonstrates that the requirements of this environmental evaluation have been completed.*

Additional investigations have been completed at the site to address data gaps reported in Section 13.2 of the CLID submitted under EE Requirement 5 (Epic 2022c). This addendum CLID has been prepared to detail additional works completed to address the data gaps and recommendations from the initial 2022 CLID, as detailed in an addendum sampling analysis and quality plan (SAQP) (Epic 2023a) included in **Appendix L**. In addition, this report presents results from additional investigation works completed following submission of the CLID on 7 September 2022.

Based on the findings of additional site investigations completed following the submission of the 2022 CLID, the majority of identified data gaps have been investigated to inform the requirements of EE Requirement 5. However, three data gaps (data gaps 4, 6 and 7) partly remain. Investigation results indicated that the site is likely to be contributing to PFAS impacts identified within the receiving environment, including Dunn Creek, Callide Creek and the associated alluvial groundwater aquifer, noting that a number of existing and new measures have been adopted to reduce potential impacts and offsite releases from the site including:

- The seepage recovery network between Ash Dam B (ADB) and Callide Creek, comprising seepage recovery wells located in the western, southern and eastern seepage areas. Current estimates indicate that >70% of seepage is recovered, with fugitive seepage from the combined eastern/southern and western seepage areas estimated to be 145 – 190 m^3/day and 26 m^3/day respectively (EMS, 2024).
    - Five additional seepage recovery bores (MW81, MW82, MW83, MW85 and MW90) were installed in August 2023 at the eastern seepage area to support seepage recovery at the site.
- Removal of seepage at Callide A release point R2 sump to recover seepage collected within the concrete outfall structure.
- Remediation through chemical stabilisation of soils at the Fuel Oil Tanks (FOT) and Fire Training Ground (FTG) with elevated concentrations of PFAS, with approximately 1.3 kg of PFAS chemically stabilised, and reporting a reduction in the leachability of PFAS of >99.7%.
- Removal and offsite disposal of PFAS impacted concrete comprising the former FTG bund, with an estimated 0.1 kg of PFAS removed from the site.

In accordance with Requirements 5(e) and 5(f) of EE E-100046349 several recommendations for additional works have been identified based on the findings of this Addendum CLID, with **Table 1** summarising remaining data gaps and recommendations for the completion of additional works.

Table 1. Summary of Remaining Data Gaps and Recommendations

Data Gap	Remaining Data Gap Details	CLID Recommendations
2 & 3	-	1. Removal of localised impacts within the Northern Stormwater Pond (NSP) at Callide A, to minimise potential migration of PFAS to Dunn Creek. PFAS impacts were reported in accumulated sediment within the NSP in the vicinity of investigation location CA15, with PFAS reported in surface water (SW44), seepage (R2) and groundwater (MW97) likely associated with this localised impact. Removal of sediments from the NSP will also assist in restoring the storage capacity of the NSP and minimise potential contribution to seepage at R2. Following removal of accumulated sediment in the NSP, review of current seepage management at R2 should be completed to determine if additional management controls are required to prevent offsite release of PFAS via this pathway.
4	Investigations completed in the eastern seepage area have confirmed the presence of two seepage pathways, with the nature and extent of seepage	2. Groundwater recovery bores (which have been tested and appropriate recovery results) installed in the eastern seepage recovery area should be

Data Gap	Remaining Data Gap Details	CLID Recommendations
	pathway further established. As part of current investigations, MW84 reported concentrations of PFAS significantly higher than previous results reported in the eastern seepage area. In addition, elevated concentrations of PFAS were reported in a sediment sample collected from the eastern diversion channel. Results for MW84 are not considered to change the current understanding of potential risk associated with the eastern seepage area based on stable concentrations observed in hydraulically downgradient bores MW32 and MW43 (refer Section 8.3). Additional investigation of the following items will assist in further understanding potential risk and informing potential remediation and/or management of PFAS impacts: • Due to the elevated concentrations of PFAS reported in MW84, future assessment to establish the source of impacts is recommended to assist in informing the ongoing management of PFAS in the eastern seepage area. The nearest known PFAS source area to MW84 (with high PFAS concentrations) is the FOT, located approximately 900 m north, however confirmation that PFAS at MW84 is associated with the FOT, and/or the inferred geological fault line has not been established. It is noted that the existing seepage recovery system is likely to include recovery of seepage from this pathway, with additional seepage recovery bores installed in proximity to MW84 and southern portions of the seepage pathway. These additional seepage recovery bores will, when operational, assist in further reducing seepage. • Current investigation results report the reduction of PFAS concentrations along the MW84-MW32-MW43 seepage pathway, however estimates of fugitive seepage from this pathway, and likely concentrations at the discharge point to Callide Creek have not been established. As noted above, seepage from this pathway is expected to be recovered by the existing seepage recovery system, and inclusion of new seepage recovery bores will assist in further reducing fugitive seepage. In addition, concentrations of surface water in Callide Creek at the inferred discharge point to Callide Creek (as represented by SW12) are generally reported at or below the Drinking Water Criteria.	incorporated into the current seepage recovery system to improve seepage recovery rates and further reduce fugitive seepage from the site. Equipping of recovery bores and incorporation into the existing seepage recovery system should be informed by CS Energys' hydrogeologist and consider relevant operational requirements and approvals (noting recovery bore MW90 is located offsite within the Cocups Road road corridor). Based on elevated concentrations of PFAS in MW84, consideration should be given to installation of a groundwater recovery bore immediately adjacent to this location. It is also recommended that a PFAS water treatment plant be incorporated into the existing site water management system. Consideration to be given to the location of such a system: options to consider include: seepage recovery system to treat seepage recovered from the eastern seepage area to remove PFAS prior to pumping into ADB; or installation of additional processing steps to remove PFAS as part of the main site water treatment plant. 3. Further assessment should be undertaken to establish the source of elevated PFAS concentrations reported at MW84 and EDC-SED-6, including assessment of potential association with the FOT and/or the inferred geological fault line, or whether impacts are associated with an alternative source area. 4. Further assessment should be undertaken to assess potential fugitive seepage from the MW84-MW32-MW43 seepage pathway, and likely concentrations at the discharge point to Callide Creek. Assessment should be completed in conjunction with assessment and management of the eastern seepage recovery area noting that seepage from this pathway is expected to be recovered by the existing seepage recovery system, and inclusion of new seepage recovery bores will assist in further reducing fugitive seepage.
6	Concentrations of PFAS have been reported to be entering the northern boundary of the site via surface water, with surface water, groundwater and sediment impacts identified within the northern and western stormwater diversion channels. Additional	5. Management of impacted surface water, groundwater and sediments along the northern site boundary will be required, however it is noted that the source of PFAS impacts is located upstream and offsite and owned by a third party. It is

Data Gap	Remaining Data Gap Details	CLID Recommendations
	investigations have not confirmed the mass flux of PFAS entering the site (refer **Section 10.4**). As such, further investigation will be required to confirm the mass flux of PFAS entering the site via these pathways. It is noted that additional investigation identified two additional watercourses entering the northern site boundary (as represented by BS3 CWE and BS3 CWN). As detailed in **Section 10.4**, CS Energy have commissioned a third party to install engineering solutions at the location of SW33 and SW34 to facilitate monitoring of water flows entering the site along the northern boundary.	recommended that CS Energy work in collaboration with upgradient landowner(s) and DESI to determine appropriate management of identified impacts. Once upstream, offsite impacts have been adequately remediated or managed, measures should be implemented to manage any residual impacts (e.g. removal of impacted sediment).
7	Potential risks to human and ecological health have been identified as detailed in **Section 15.2** and **Section 15.3** respectively. Further assessment of risk is required to quantify potential risks to human and ecological receptors. It is noted this work has commenced with CS Energy commissioning a risk assessor to complete a human health and ecological risk assessment (HHERA) to inform potential risks to ecological receptors.	7. A Human Health and Ecological Risk Assessment (HHERA) should be completed to assess potential risks identified for human health (refer **Section 15.2**) and ecological receptors (refer **Section 15.3**).
-	-	6. Ongoing management of the FOT and FTG areas will be required, with management to be informed by results of remediation and validation works, along with previous investigation of the surrounding area. As part of management of residual soil impacts, the FOT and FTG should be incorporated into CS Energy's Site Permit to Work (PTW) and Penetration Permitting systems.
-	-	8. Monitoring of groundwater and surface water should continue at select groundwater and surface water locations across the site and within the study area to provide ongoing assessment of PFAS. The monitoring locations should target key migration pathways and the receiving environment to monitor potential impacts to human health and ecological receptors. Monitoring should also include monitoring locations which inform the effectiveness of and/or impacts associated with implementation of remediation and management works undertaken at the site. 9. Callide Power Station's Environmental Authority EPPR00536313 Condition 2(G3) outlines the requirements of a groundwater monitoring program and that "The submitted ground water monitoring program must be maintained". It is recommended that the Callide Power Station ground water monitoring program be updated to include: a. Nominated groundwater and surface water locations as identified to provide ongoing assessment of PFAS as outlined in the recommendation above b. PFAS monitoring constituents for each location.

1 INTRODUCTION

CS Energy Limited (CS Energy) currently operate the Callide Power Station (the site or the station) site, located approximately nine km north-east of Biloela, Queensland. Following release of the Queensland Department of Environment and Sciences' (DES's) (now the Department of Environment, Science and Innovation (DESI))Operational Policy[2] for the management of firefighting foam in 2016, CS Energy undertook a review of site operations and identified historical use of per- and poly-fluoroalkyl substances (PFAS). This review identified aqueous film forming foams (AFFF) have been used historically over the life of the station. Removal of all non-compliant AFFF commenced in late 2018, with all non-compliant AFFF removed from service and disposed to a licensed disposal facility prior to 2019.

In conjunction with the removal of non-compliant AFFF, CS Energy committed to DES to undertake a voluntary PFAS Environmental Investigation, to assess potential impacts associated with the former use of PFAS containing products at the site. Epic Environmental (Epic) was engaged by CS Energy as their suitably qualified person (SQP) to undertake assessment of PFAS at the site as part of this voluntary investigation. Under the voluntary arrangement, CS Energy also submitted an initial monitoring plan to DES detailing proposed sampling of groundwater, surface water, sediment and soils.

Initial investigations completed at the site in 2019 targeted existing onsite and offsite environmental monitoring locations, with the investigation expanded during 2021 to include sampling of private groundwater supply wells up to 12 km downstream of the site. To date, a total of 158 groundwater monitoring bores and 50 surface water monitoring locations have been sampled. Results from monitoring completed to date report concentrations of the Sum of PFOS and PFHxS above the Australian Drinking Water Guideline (0.07 µg/L) in onsite and offsite groundwater monitoring wells (Sum of PFOS and PFHxS up to 33.50 µg/L and 6.59 µg/L respectively) and onsite and offsite surface water (Sum of PFOS and PFHxS up to 0.595 µg/L and 0.0887 µg/L respectively). All results from sampling completed to date have been provided to DES, Queensland Health, the Department of Agriculture and fisheries (DAF), and the Contaminated Land Auditor (CLA). CS Energy has also provided results to the relevant private landholders.

A Notice to conduct or commission an Environmental Evaluation (EE) notice (Reference: EPPR00536313 | CCPLRC-100046232 | E-100046349, dated 15 December 2021) (DES, 2021) was formally issued by DES requiring CS Energy to commission an environmental investigation to determine the nature and extent of impact arising from any direct or indirect release of PFAS from the historical use of AFFF at the site.

In accordance with Requirement 5 of the EE, a Contaminated Land Investigation Document (CLID), comprising a site investigation report, was submitted to DES on 7 September 2022. The CLID comprised the following report:

- *Callide Power Station – Contaminated Land Investigation Document (Site Investigation), 7 September 2022 (Epic 2022c)*

Following submission of the CLID, a meeting was held with DES to discuss the seven remaining data gaps detailed in the CLID (data gaps 1 to 7) and agree on a timeframe to complete additional investigation required to address the data gaps. Correspondence received by DES on 4 October 2022 (DES,2022b) requested CS Energy complete additional works and provide an addendum CLID report to satisfy the Requirement 8 of the amended EE (DES, 2023). A further time extension was granted on 21 August 2023 to complete the additional works, with the final requirement as follows:

Requirement 8: *By 5:00 pm on 8 March 2024 you must submit a final environmental report to department that demonstrates that the requirements of this environmental evaluation have been completed.*

Additional investigations required to be completed included further investigation to close data gaps reported in Section 13.2 of the CLID submitted under EE Requirement 5 (Epic 2022c). This addendum CLID has been prepared to detail additional works completed to address the data gaps and recommendations from the CLID, as detailed in an addendum sampling analysis and quality plan (SAQP) (Epic 2023a) included in **Appendix L**. In addition, this report presents results from additional investigation works completed following submission of

[2] Operational Policy: Environmental Management of Fire Fighting Foam. Department of Environment and Heritage Protection (now DESI), 7 July 2016.

the CLID on 7 September 2022. Details of CLID data gaps and recommendations and additional works are outlined in **Section 1.2**. This addendum CLID is to be read in conjunction with the initial CLID (Epic 2022c) and addendum SAQP (Epic 2023a).

1.1 EE Requirements

Section B of the amended EE details several requirements as detailed in **Table 2**. Following submission of the initial CLID in 2022 (refer to Requirement 5 in **Table 2** below), two amended EE notices (DES, 2022 and DES, 2023) were issued which included revised timeframes for completion (i.e. Requirement 8). A copy of the original EE (DES, 2021) and amended EE notices (DES, 2022a and DES, 2023) are included in **Appendix B**.

Table 2. Summary of, and Assessment against EE E-100046349 Requirements (DES, 2023)

Item	EE E-100046349 Requirements (Section B)	Details of Compliance / Comment
1	By **5:00 pm on 17 December 2021** you must engage an independent SQP under the Act to carry out the requirements of this notice. The SQP must demonstrate skills and experience in technical fields such as soil and groundwater contamination assessment and with particular skills relevant to AFFF firefighting foams containing PFAS.	Engagement letter sent to DES on 16 December 2021. SQP details are presented in **Appendix A**.
2	By **5:00 pm on 17 December 2021** you must engage an approved contaminated land auditor to undertake an auditor's function as outlined in Section 568(b) of the Act, to oversee the SQP carrying out the requirements of this notice.	Engagement letter sent to DES on 16 December 2021.
3	By **5:00 pm on 28 February 2022** you must develop and submit a sampling, analysis and quality plan (SAQP) to the department to characterise the potential source and extent of PFAS contamination likely to be caused from the release of AFFF at the premises for the purpose of preparing a site investigation report as defined in section 387 of the Act. This plan must be prepared by a SQP and consented to by a contaminated land auditor. This investigation detailed in the SAQP must, as a minimum:	A SAQP (Epic 2022a) was submitted to DES on 28 February 2022. An addendum SAQP (Epic 2023a) was approved by the CLA on 10 May 2023.
3(a)	evaluate the nature and extent of PFAS contamination likely to have been caused by any direct or indirect release of AFFF from the premises to soil, water, groundwater, sediments and, include biota sampling in Callide Creek adjoining the premises as part of the investigation; and	
3(b)	assess likely pathways of PFAS contamination from the release of AFFF from the premises including, but not limited to, the premises, surface waters, drainage lines, stormwater infrastructure and groundwater in the vicinity of the premises; and	
3(c)	assess the nature of the connectivity/completeness of those likely pathways by, assessing (where applicable) groundwater levels versus surface water levels and connectivity, hydraulic conductivity and groundwater velocity, and evaluate the potential for surface water releases from Callide dam to enhance migration of PFAS contaminants from the site.	
3(d)	the sampling analysis must be generally in accordance with all requirements stated in Requirement 7.	
4	By **5:00 pm on 7 March 2022** you must commence sampling and analysis in accordance with the SAQP required by Requirement 3.	Completed as part of the initial CLID (Epic, 2022c), with works commencing prior to the SAQP issued under Requirement 3 on 28 February 2022.
5	By **5:00 pm on 7 September 2022** you must submit a contaminated land investigation document (CLID) in accordance with the content requirements of section 389 of the Act, that is a site investigation report detailing the findings of the sampling, analysis and quality plan to determine the nature and extent of impact arising from any direct	Initial CLID (Epic, 2022c) submitted to DES on 7 September 2022.

Item	EE E-100046349 Requirements (Section B)	Details of Compliance / Comment
	or indirect release of any hazardous PFAS contaminants from the release of AFFF. The CLID must also include, but is not limited to the following:	
5(a)	Evaluate known historical activities undertaken at the premises which has involved the use, storage (including volume), handling, foam types and potential release of AFFF PFAS containing material;	Refer to the initial CLID (Epic, 2022c).
5(b)	Provide analytical data that characterises the nature of the PFAS at the premises and that which has been released or potentially released to assist in determining the nature and extent of PFAS contamination in the receiving environment;	Previous investigation results and data gaps are presented in the initial CLID (Epic, 2022c). **Section 6** to **Section 14** of this addendum CLID presents the additional investigations conducted and the analytical data associated with each data gap.
5(c)	Provide analysis of potentially affected media including soil, sediment, surface water, groundwater and biota and identify potential pathways for impacts to human and biota receptors;	Analytical data associated with each data gap and additional investigations is presented in **Section 6** to **Section 14.** A revised Conceptual Site Model (CSM), including assessment of source-pathway-receptor linkages is presented in **Section 15**.
5(d)	Provide all monitoring results and an analysis of the extent of PFAS contamination in soils, sediment, surface water, groundwater and biota;	A full copy of all monitoring results is provided in **Table T2** (PFAS in surface and groundwater), **Table T4** (PFAS in Sediment), **Table T5** (PFAS in Soil Ash) and **Table T6** (PFAS Leachability). Laboratory documentation is included in **Appendix K**.
5(e)	Assess the potential for environmental harm (actual or potential) and provide recommendations for the implementation of reasonable and practicable options to prevent or minimise any further releases of PFAS from identified sources and manage and monitor environmental and human health risks; and	A review of actual or potential risk for environmental harm is provided in **Sections 15.2** (Human Health) and **15.3** (Ecological). Recommendations are detailed in **Section 16.3** which recommends the development of a Human Health and Ecological Risk Assessment (HHERA).
5(f)	Provide remediation options to remove the contamination and treat the contamination taking into account the extent of any residual contamination in soils, sediment, groundwater and surface waters that affect the premises or other receptors.	Recommendations for additional works, including remediation and management of residual impacts are detailed in **Section 16.3.** **Section 12** details remediation and validation works completed at the Fuel Oil Tanks (FOT) and Fire Training Grounds (FTG).
6	The investigations required by this notice must meet the requirements for a CLID for the land in accordance with section 389 and 390 of the Act. A CLID must be prepared by a SQP as required by and in accordance with Chapter 12, Part 3 of the Act and be accompanied by an auditor certification that the CLID complies with section 389(1) and (2) of the Act.	This report has been prepared by a SQP (Refer **Section 1.2** is considered to comply with the requirements for a CLID in accordance with the *Environmental Protection Act 1994*.
7	You must ensure that the following requirements, to the extent that they are applicable and specified requirements are not otherwise referred to, are met when conducting the investigation and preparing the report:	Previous investigations along with current investigations detailed in this report are considered to comply with the stated legislation, guidelines and standards.

Item	EE E-100046349 Requirements (Section B)	Details of Compliance / Comment
		References to relevant guidelines are made where applicable.
7(a)	The investigation is conducted in accordance with the following: the Act – see https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-1994-062; The Policy – see https://www.legislation.qld.gov.au/view/pdf/inforce/current/sl-2019-0156; Queensland Water Quality Guidelines (2009) – see https://environment.des.qld.gov.au/management/water/quality-guidelines; Monitoring and Sampling Manual 2018 Environmental Protection (Water) Policy 2009 Version 2 June 2018 see - https://environment.des.qld.gov.au/__data/assets/pdf_file/0031/89914/monitoring-sampling-manual-2018.pdf; National Environmental Protection (Assessment of Site Contamination) Measure 1999 – see http://nepc.gov.au/nepms/assessment-site-contamination; Queensland Auditor Handbook for Contaminated Land – see https://www.qld.gov.au/environment/pollution/management/contaminated-land/auditors/auditor-handbook; Assessment of impact of human health considering the Tolerable Daily Intakes for PFOS, PFOA, and PFHxS recommended by Food Standards Australia New Zealand (FSANZ); Where PFAS are encountered in water bodies at the premise which are accessible to fauna such as birds and mammals, qualitative consideration of water to animal bioaccumulation factors reported in research publications concerning those contaminants in evaluating potential environmental harm to such animals; and assessment of contamination considering guidance provided in the PFAS NEMP[1] – see https://www.qld.gov.au/environment/pollution/management/disasters/investigation-pfas/management-plan.	Investigation completed in accordance with referenced guidelines, as detailed within the report.
7(b)	An assessment of edible portions (biota) must be used in estimating risks of exceeding the tolerable daily intakes, being consistent with the Queensland Health Guideline for sampling and analysis of seafood suitable for human health risk assessments of PFAS contamination (see https://www.qld.gov.au/__data/assets/pdf_file/0032/68684/pfas-fish-sampling-protocol.pdf) and adopting portion sizes recommended by Food Standards Australia New Zealand (FSANZ) in addition to assessment of whole species (biota) to evaluate bioaccumulation risk; and	Details on aquatic biota sampling is presented in **Section 11**, with the Aquatic Biota investigation report included as **Appendix M**. All works were completed in accordance with the nominated guidelines and standards, and the aquatic biota sampling plan is included as **Appendix E** of the initial CLID (Epic, 2022c).
7(c)	Wherever practical, all samples must be analysed by a NATA accredited laboratory (it is noted that in biota sampling this may not be applicable); and	Laboratory analysis for current and previous investigations were completed by Australian Laboratory Services (ALS) (primary laboratory) and Eurofins MGT (Eurofins) (secondary laboratory). Both laboratories are National Association of Testing Authorities (NATA) accredited for the analytical testing completed.
7(d)	The analytical data on all media (soil, sediment, water, groundwater and biota) must include results for sampling to determine total organic fluorine, total oxidisable precursor (TOP) assay, and the suite of 20 to 28 standard fluorinated organic compounds by liquid chromatography-mass spectrometry (LC/MS/MS) available from	Information on laboratory analysis for each data gap and additional investigations is presented in **Section 6** to **Section 14**.

Item	EE E-100046349 Requirements (Section B)	Details of Compliance / Comment
	commercial laboratories reported as the analyses for the resulting perfluorinated carboxylates for C4 to C14 carbon chain length (TOP C4-C14); and	Analysis for Total Oxidisable Precursor Assay (TOPA) and total organofluorine (TOF) has been completed on representative samples for each media to assess the potential presence of PFAS precursor compounds (including TOPA and TOF).
7(e)	Note that as analytical and instrumental improvements are made regarding the analysis for PFAS it is understood that some laboratories are increasing the standard suite which may assist you in distinguishing between the premises sources of PFAS and other potential sources; and	Laboratory analytical suites employed for current and previous investigations are considered sufficient for evaluation of data against the criteria detailed in **Section 4**, with analysis including the standard suite of 28 PFAS compounds.
7(f)	Where TOP Assay is performed, quality assurance checks must include that oxidant exhaustion has not occurred (e.g. reanalysis to determine presence of fluorotelomer); and	As required, QA checks were completed for TOPA analysis completed in accordance with Section 19.2 of the PFAS NEMP (Refer **Table T8** [water] and **Table T9** [soil]).
7(g)	Groundwater bores are constructed in accordance with the Minimum Construction Requirements for Water Bores in Australia (4th edition).	All investigations have been completed from existing groundwater monitoring wells. It is understood that all wells were constructed to minimum requirements at the time, with groundwater monitoring infrastructure progressively installed at the site since 1996. A detailed review of groundwater monitoring infrastructure is included in Appendix H of the CLID (Epic, 2022c) New groundwater monitoring wells, including monitoring wells and recovery bores installed by GHD (refer **Section 14.1**) were completed in accordance with this requirement.
8‡	By **5:00 pm on 8 March 2024** you must submit a final environmental report to department that demonstrates that the requirements of this environmental evaluation have been completed.	This report.

Notes: ‡ Requirement from Amended EE (DES, 2022a and DES, 2023)
[1] PFAS National Environmental Management Plan (NEMP), Version 2.0, January 2020. Heads of EPAs Australia and New Zealand (HEPA)

1.2 Data Gaps and CLID Recommendations

The initial CLID submitted to DES (Epic 2022c) identified seven data gaps requiring further investigation. In addition, and in accordance with Requirements 5(e) and 5(f) of the EE, several recommendations for additional works were identified. **Table 3** summarises the data gaps and recommendations presented in the initial CLID.

Table 3. Data Gaps and CLID Recommendations presented in initial CLID (Epic, 2022c)

Data Gap	Data Gap Details	CLID Recommendations
1	Results from soil and sediment investigations at Ash Dam 4 indicate that a localised source of PFAS may be present within Ash Dam 4. Further investigation will be required to determine the nature and extent of potential impacts at Ash Dam 4.	Further investigation should be undertaken at Ash Dam 4 to confirm the nature and extent of PFAS impacts identified in soil and sediment. Results of the investigation should be used to inform any remediation, mitigation, or management measures to be implemented to prevent or minimise potential ongoing risks to ecological and human health receptors (noting Ash Dam 4 is located within the Waste Containment Facility, upstream of ADB).
2	Soil investigations completed at Callide A indicate a localised PFAS impact may be present within the catchment of the Northern Stormwater Pond, with elevated concentrations of PFAS reported in soils (coal ash/dust) within the northern sediment pond along with surface water. Further investigation will be required to determine the nature and extent of potential impacts at the Callide A Northern Stormwater Pond.	Further investigation should be undertaken at Callide A to determine the nature and extent of PFAS impacts identified in the Callide A Northern Stormwater Pond (NSP) and confirm potential linkages with surface water discharges to Dunn Creek. Results of the investigation should be used to inform any remediation, mitigation or management measures to be implemented to prevent or minimise releases of PFAS from the Callide A site.
3	PFAS is reported to be present in Dunn Creek, with results indicating that discharges from the Callide A site (via release point R2) are likely to be contributing to PFAS concentrations, noting limited water is released via R2 and PFAS impacts were also reported in upstream surface water within Dunn Creek (downgradient of the Callide Mine). No PFAS was identified in ash (soil samples) within Ash Dam 2 or the majority of soil samples collected at Callide A, with PFAS reported at R2 likely associated with soil impacts identified at the Northern Stormwater Pond. Further investigation will be required to confirm the source of PFAS reported within R2.	
4	Groundwater results indicate that the eastern seepage area likely comprises at least two seepage pathways, one associated with the current seepage pathway and seepage recovery system, and an additional longer pathway associated with fractured rock which includes monitoring well MW32. Further investigation will be required to confirm the nature and extent of seepage pathways at the eastern seepage area.	Further investigation of existing seepage pathways (eastern, southern and western) should be undertaken to confirm the extent of current seepage pathways, identify any additional pathways and confirm linkages with the receiving environment. In particular, further investigation is required to determine the nature and extent of the secondary seepage pathway identified at the eastern seepage area, as represented by MW32. Results of the investigation should be used to inform refinement of the existing seepage recovery systems and/or implementation of additional measures to minimise or prevent seepage releases from the site. It is noted that at the time of reporting, CS Energy has engaged a geophysicist to undertake a geophysical survey of the current seepage areas and surrounding areas to map known and potentially unknown seepage pathways from the Callide B and C sites.
5	Groundwater results from the western seepage area indicate some wells, including MW49, may be outside the current groundwater seepage recovery area. In addition, surface water within the western stormwater diversion channel (carrying stormwater from the north) may infiltrate through alluvial soils in the south-western portion of the site, potentially contributing to PFAS impacts in groundwater. Further investigation will be required to confirm the nature and extent of seepage pathways at the western seepage area along with potential contribution from surface water infiltration.	
6	High concentrations of PFAS have been reported to be entering the northern boundary of the site via surface water, with surface water, groundwater and sediment	Management of impacted surface water, groundwater and sediments along the northern site boundary will be required, however it is noted that the source of

Data Gap	Data Gap Details	CLID Recommendations
	impacts identified within the northern and western stormwater diversion channels. Further investigation will be required to assess the nature (including mass) of PFAS entering the site via these pathways. It is noted that management of PFAS impacts from these pathways will need to be undertaken in conjunction with remediation and/or management of offsite source areas.	PFAS impacts is located offsite and owned by a third party. On this basis, any remediation or management of impacts identified at the site will need to be in collaboration with upgradient landowner(s) and DES. Temporary PFAS management options should be investigated (i.e. passive sorption water treatment technologies) to determine their suitability for interim management of PFAS impacted surface water, noting adoption and implementation of any technologies should be undertaken in collaboration with upgradient landowners and DES. Once offsite impacts have been adequately remediated or managed, measures should be implemented to manage any residual impacts (i.e. removal of impacted sediment).
7	Potential risks to human and ecological health have been identified (refer **Section 15.2** and **Section 15.3** respectively). Further assessment of risk will be required to be completed to quantify potential risks to human and ecological receptors. It is noted that biota sampling is proposed to be completed (refer Section 11 of the initial CLIDE (Epic, 2022c) to inform potential risks to ecological receptors.	Completion of proposed biota sampling detailed in Section 11 of the initial CLIDE (Epic, 2022c) is recommended to be undertaken during the next wet season period. Sampling should be undertaken in accordance with the sampling plan provided in **Appendix B**. Following completion of biota sampling, a Human Health and Ecological Risk Assessment (HHERA) should be completed to assess potential risks to human health (refer **Section 15.2**) and ecological receptors (refer **Section 15.3**).
-	-	Remediation of PFAS impacted soils identified at the fire training ground and fuel oil tanks should be undertaken to the extent practicable to prevent or minimise potential ongoing risks to ecological and human health receptors. Highest concentration of PFAS were reported in areas immediately surrounding the Fuel Oil Tank bund and the Fire Training Ground bund, and are considered to represent the extent of primary impacts associated with the historical use/release of AFFF. However, it is noted that residual impacts in surrounding areas was reported. At the time of reporting, CS Energy has appointed a remediation contractor to undertake remediation of the FTG and FOT area. Remediation is proposed to comprise onsite stabilisation through addition of a powdered activated carbon product.
-	-	Monitoring of groundwater and surface water should continue at select groundwater and surface water locations across the site and within the study area to provide ongoing assessment of PFAS within key migration pathways (including Callide A/Dunn Creek, the northern and western stormwater diversion channels and the western and eastern seepage areas) and the receiving environment to monitor potential impacts to human health and ecological receptors. Monitoring should also include monitoring locations which inform the effectiveness of and/or impacts associated with implementation of remediation and management works undertaken at the site.

1.3 Roles and Responsibilities

Epic was engaged by CS Energy to perform the function of a SQP in accordance with the requirements of the original and amended EE (refer to Section 1.1). The key roles relating to the project have been summarised in **Table 4** below. A copy of the SQP declaration and supporting documentation is included in **Appendix A**.

Table 4. Key Roles

Aspect	Details
Suitably Qualified Person (SQP)	Mr Luke Amies Epic Environmental Pty Ltd Completion of environmental investigations and reporting requirements of the original and amended EE
Contaminated Land Auditor (CLA)	Mr Mark Stuckey Environmental Earth Sciences Oversee SQP carrying out the requirements of the original and amended EE and undertake an Auditor's Function in accordance with Section 568(b) of the *Environmental Protection Act 1994*.
Recipient / Site Owner	CS Energy Limited Level 12, 31 Duncan Street Fortitude Valley QLD 4006 Commissioning of and compliance with requirements of the original and amended EE.

2 SITE DESCRIPTION AND BACKGROUND

A detailed summary of the site and relevant background information is presented in the initial CLID (Epic 2022c), with a summary of key information and new/updated information presented below.

2.1 Site Identification

The site occupies two land parcels located at Biloela Callide Road, Mount Murchinson as outlined in **Table 5.** Operational areas of the power station are split between the two lots, with the majority of the Waste Containment Facility located within Lot 1 on Registered Plan (RP) 615528 as shown in **Figure 1.**

Table 5. Site Identification

Aspect	Detail	Detail
Lot Details	1 RP615528	4 on Survey Plan (SP) 103557
Address	Biloela Callide Road, Mount Murchison QLD 4715	Biloela Callide Road, Mount Murchison QLD 4715
Area (ha)	631.933	239.200
Site Owner	CS Energy Limited	CS Energy Limited
Local Government Authority	Banana Shire Council	Banana Shire Council
GPS Coordinate (centroid) – Lat/Long GDA2020	-24.34965, 150.60836	-24.33583, 150.62181

Current Use and Main Features	• Callide C and part of Callide B Power Stations and associated infrastructure.
	• The western portion of the current Waste Containment Facility comprising of:
	  • Drains Reclaim Dam (DRD) and the majority of the Evaporation Ponds.
	  • Ash Dam B (ADB) and associated seepage recovery system.
		• Callide A and balance of Callide B Power Stations and associated infrastructure, including an administration building.
		• Coal Plant
		• Ash Dams 1, 2, 3 and 4

Proposed Use	Not determined	Not determined
Zoning	Special Industry	Special Industry
EMR Status	Included on Environmental Management Register (EMR) (refer **Section 2.2**). Not included on Contaminated Land Register (CLR)	Included on EMR (refer **Section 2.2**). Not included on CLR
EMR ID	12271	30829
Environmental Authority	The site currently operates under EA EPPR00536313 and EPPR00707213 for Lot 1 RP615528 and Lot 4 SP103557. The EA's outline the following approved Environmentally Relevant Activities (ERAs) for both lots: • ERA 08 - Chemical Storage, 1: Storing a total of 50t or more of chemicals of dangerous goods class 1 or class 2, division 2.3 under subsection (1)(a) • ERA 08 - Chemical Storage, 3: Storing more than 500 cubic metres of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c) • ERA 14 - Electricity Generation, 2: Generating electricity by using a fuel, other than gas, at a rated capacity of, (b) more than 150MW electrical • ERA 56 - Regulated Waste Storage, Receiving and storing regulated waste • ERA 60 - Waste disposal, 1: Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1) (a), (d) more than 200,000t • ERA 63 - Sewage Treatment, 1: Operating sewage treatment works, other than no-release works, with a total daily peak design capacity of, (b-ii) more than 100 but not more than 1500EP otherwise	

Aspect	Detail	Detail
	Review of historical records indicates two former EAs were issued for the site as follows: • EPPR00248513 (cancelled Feb 2001) – Callide A/B Power Station – ERA: Chemical Storage >10m^3 but <1,000m^3 • EPPR00273613 (cancelled Feb 2001) – Callide A/B Power Station – ERA: Crude Oil Storing >10,000L but <500,000L	



Figure 1. General Site Layout (source: Queensland Government 2024)

2.2 Environmental Management Register

Lot 1 RP615528 is listed on DESI's EMR) (EMR ID: 12271) for the following Notifiable Activities and/or Hazardous Contaminants:

- Petroleum Product or Oil Storage
- Chemical Storage
- Coal Fire Power Station
- Waste Storage, Treatment or Disposal
- Hazardous Contaminant: Asbestos and synthetic mineral fibres

Lot 4 SP103557 is listed on DES's EMR (EMR ID: 30829) for the following Notifiable Activities:

- Asbestos Manufacture or Disposal
- Petroleum Product or Oil Storage
- Chemical Storage
- Coal Fire Power Station
- Waste Storage, Treatment or Disposal

Following identification of PFAS at the site, notification was provided to DES on 17 November 2020. Further notification was provided on 1 December 2020 and 5 February 2021 based on results of further investigations undertaken at the site.

The EMR listing for Lot 1 RP615528 was updated on 20 November 2023 to include the presence of a hazardous contaminant (asbestos and synthetic mineral fibres), with a copy of the EMR notice for Lot 1 (20 November 2023) and the EMR search result for Lot 4 (5 September 2022) included in **Appendix C**.

Lots 1 RP615528 and 4 SP103557 are not included on the CLR.

2.3 Site History, Layout, Background and Previous Investigations

Details on the history, layout, background and previous investigations completed at the site are presented in the Initial CLID (Epic, 2022c). For the purposes of this addendum CLID, key aspects associated with the site are consistent with those reported in the initial CLID (Epic, 2022c), with additional information relevant to the current PFAS environmental investigation presented in **Section 6** to **Section 14**.

During the investigation period (October 2022 to December 2023) the site continued to operate as a Coal Fired Power Station in accordance with the site's EA (EPPR 00536313 and EPPR 00707213). While some site conditions have changed throughout the investigation period (i.e. demolition and construction of the Callide C cooling towers, rebuilding of Callide C turbine and generator), these aren't considered to materially impact the aspects related to this investigation and/or change details presented in the Initial CLID (Epic, 2022c).

3 DATA QUALITY OBJECTIVES (DQOS)

The DQOs process is a planning tool developed to ensure that any data collected is of sufficient quality and quantity to support defensible decision making. It is a process used to define the type, quantity and quality of data needed to support decisions relating to the environmental condition of a site and provides a systematic approach for defining the criteria that a data collection design should satisfy.

It is recognised that the most efficient way to accomplish these goals is to establish criteria for defensible decision making before the data collection begins, and then develop a data collection design based on these criteria. Using the DQOs process to plan the data collection assists in improving the effectiveness, efficiency and defensibility of a decision in a resource and cost-effective manner.

DQOs were developed in accordance with US EPA 2000[3] and 2006[4] to detail the type of data that is needed to satisfy the overall project objectives to inform the principal study questions identified for the site including:

- What is the nature and extent of PFAS contamination associated with direct or indirect releases of AFFF?
- What are the likely pathways associated with PFAS contamination at the site to other areas of the site, surface waters, drainage lines, stormwater infrastructure and groundwater?
- What are the likely pathways associated with PFAS to human and biota receptors?
- For pathways identified, what is the nature of the connectivity/completeness of these pathways?
- What is the nature and extent of any environmental harm (actual or potential) arising from the direct or indirect release/use of PFAS into the environment?

A summary of the DQO outputs are presented in **Appendix F** (sourced from Section 5 of the Addendum EE SAQP (Epic 2023a)), with a summary of investigation results presented in the following sections.

[3] US EPA (2000), Data Quality Objectives, Process for Hazardous Waste Site Investigations, EPA QA/G-4HW, (Ref. EPA/600/R-00/007).
[4] US EPA (2006), Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4, (Ref. EPA/240/B-06/001).

4 ASSESSMENT CRITERIA

4.1 Groundwater and Surface Water Assessment Criteria

Groundwater and surface water analytical data have been compared against relevant assessment criteria with regards to human health and the environment. The adopted assessment criteria, along with guidance documents used to establish the screening/investigation levels are summarised in **Table 6**.

Table 6. Adopted Groundwater and Surface Water Assessment Criteria

Media	Potential Contaminant of Concern	Criteria	Potential Receptor	Description	Guideline Source
Groundwater and Surface Water	Sum of PFOS and PFHxS	0.07 µg/L	Human Health	Drinking Water	• Australian Drinking Water Guidelines 6, 2011 (v3.8 September 2022) • PFAS National Environmental Management Plan (v2.0 January 2020)
	PFOA	0.56 µg/L			
	PFOS/PFHxS	2 µg/L		Recreational Water	• NHMRC Guidance on Per and Polyfluoroalkyl substances (PFAS) in Recreational Water (2019) • PFAS National Environmental Management Plan (v2.0 January 2020)
	PFOA	10 µg/L			
	PFOS	0.00023 µg/L	Ecological	99% species protection	PFAS National Environmental Management Plan (Freshwater)
	PFOA	19 µg/L			
	PFOS	0.13 µg/L		95% species protection	PFAS National Environmental Management Plan (Freshwater)
	PFOA	220 µg/L			

Concentrations were compared to 99% Species Protection Guideline Values due to the proximity of the site to sensitive environmental receptors including Callide Creek and the potentially bioaccumulative nature of PFAS[5], with results also compared to 95% Species Protection Levels to indicate likely impacts to environmental values (direct toxicity), noting that the 99% Species Protection Levels may be below ambient background concentrations.

4.2 Soil and Sediment Assessment Criteria

Soil and sediment analytical data was compared against relevant assessment criteria with regards to human health and the environment. The adopted assessment criteria, along with guidance documents used to establish the screening/investigation levels are summarised in **Table 7.**

It is noted that while no sediment specific PFAS guideline exists, the use of soil criteria is deemed suitable for assessment based on the site setting and nature of sediment encountered at the site (generally comprising accumulated soil material deposited in drainage pathways as a result of erosion and transport via overland flow).

[5] NEMP 2018, Table 5: The WQG advise that the 99% level of protection be used for ...slightly to moderately disturbed systems'. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife.

Table 7. Adopted Soil and Sediment Assessment Criteria

Media	Potential Contaminant of Concern	Criteria	Potential Receptor	Description	Guideline Source
Soil and Sediment	PFOS/PFHxS	1 mg/kg	Human Health	Public Open Space [offsite soils/ sediments]	PFAS National Environmental Management Plan Soil
	PFOA	10 mg/kg			
	PFOS/PFHxS	20 mg/kg		Industrial / Commercial [onsite soils/ sediments]	PFAS National Environmental Management Plan Soil
	PFOA	50 mg/kg			
	PFOS	1 mg/kg	Ecological	Ecological Direct Exposure	PFAS National Environmental Management Plan Interim Soil
	PFOA	10 mg/kg			
	PFOS	0.01 mg/kg		Ecological Indirect Exposure (Residential) [offsite soils/ sediments])	PFAS National Environmental Management Plan Interim Soil
		0.14mg/kg		Ecological Indirect Exposure (Industrial / Commercial) [onsite soils/ sediments]	

5 METHODOLOGY

The adopted methodology for collection of samples was completed in accordance with Requirement 7 of the EE, and the requirements of Addendum EE SAQP (Epic, 2023a).

5.1 Groundwater and Surface Water Sampling Schedule

Groundwater and surface water sampling was completed in accordance with the Addendum EE SAQP (Epic, 2023a) as detailed in **Table 8**.

Table 8. Groundwater and Surface Water Monitoring Program

Sampling Scope	Area of Interest	Sample Locations	Proposed Sampling Schedule				
			Q1 [Feb/Mar23]	Q2 / Dry Season / Annual Event [May/Jun23]	Q3 [Aug/Sep23]	Q4 / Wet Season Event [Nov/Dec23]	Rainfall Event (>25mm) [A]
Groundwater	Northern Site Boundary	MW74	X	X	X	X	
	Callide A	MW96 MW97		X	X	X	
	Eastern Seepage	MW32 MW42 MW43	X	X	X	X	
		ESC3 ESC4 MW31 MW33		X		X	
	Southern Seepage	MW09 MW78	X	X	X	X	
	Western Seepage	MW40 MW49 MW56 MW68	X	X	X	X	
	Callide Creek	MW72 MW73 MW80	X	X	X	X	
		MW70 MW69		X		X	
	Callide Alluvium	L005-B01[1] L006-B05[1] L012-B01[1] L021-B01[1] RN13030698[2] RN13030127[2] RN13030697[2] RN13030692[2] RN13030126[2] RN13030112[2] RN13030715[2]	X	X	X	X	
Surface Water	Callide Dam	SW20		X		X	
	Northern Boundary	SW06 SW33 SW34 SW45 BS3-CWN	X	X	X	X	X
		BS3-CWE BS30-CW					X

Sampling Scope	Area of Interest	Sample Locations	Proposed Sampling Schedule				
			Q1 [Feb/Mar23]	Q2 / Dry Season / Annual Event [May/Jun23]	Q3 [Aug/Sep23]	Q4 / Wet Season Event [Nov/Dec23]	Rainfall Event (>25mm) [A]
	Western Stormwater Drainage Channel	SW48 SW28 Additional locations (west of v-notch 1 and 2)		X		X	X
	Callide A / Dunn Creek	R2	X	X	X	X	X
		SW43 SW44	X	X	X	X	X
		SW18 SW17 SW42					X
	Onsite Water Bodies	DRD PW2	X	X	X	X	X
	Western Seepage Area	SW13		X		X	X
	Callide Creek	SW02 SW12 SW22 SW40	X	X	X	X	X
		SW41		X		X	

Notes: [A] – event-based sampling is to occur within 72 hours of a rain event >25mm (72 hr) as recorded onsite, with sampling to be limited to one event per month
[1] Landowner groundwater supply bore
[2] Department of Resources monitoring bore

Following installation of additional groundwater monitoring and recovery wells (refer to **Section 14.1**), MW81 to MW85, MW89 to MW91, MW94 and MW98 were included as part of the quarterly monitoring scope.

5.2 Soil Sampling Methodology

Sampling of soil was completed in accordance with methodology detailed in **Table 9**.

Table 9. Soil Sampling Methodology

Action	Description
Permit to Work	Soil sampling was completed under a Site Permit to Work (PTW) and a Digging, Excavation and Building Penetration Checklist. Permits were obtained in accordance with the CS Energy Permit to Work Manual (CS-PTW-01) and Digging, Excavation and Building Penetration (CS-PTW-HAZ-04) prior to the commencement of works.
Soil Sampling	Soil samples were generally collected using a drill rig utilising single-use disposable pushtubes and/or solid flight augers, with drilling terminated at target depth or prior refusal. Soil samples were collected directly from the pushtube sleeve or auger flight, directly from the soil surface or from material returned on the hand auger using disposable nitrile gloves, which were replaced between the collection of each sample. The soil samples were immediately transferred into laboratory supplied PFAS sampling containers.
Soil Logging	Logging of investigation locations was conducted in general accordance with the Unified Soil Classification System and AS 1726-1993. Descriptions were recorded on Epic's standard field log sheets for uniformity in descriptions, presentation and to aid in future interpretations.

Field QA/QC	Field intra- and inter-laboratory duplicates of soil samples were prepared in the field by collecting blind and split samples from the same depth. Duplicate sample pairs were collected and analysed at a rate of 1 in every 10 primary samples in accordance with the PFAS NEMP.
Decontamination	Soil sampling was completed using dedicated disposable equipment (pushtubes) along with decontaminated solid flight augers, and a hand auger where access was limited. Reusable equipment was decontaminated by hand between each sampling location and event which included scrubbing thoroughly with a plastic brush and rinsing with clean water followed by a triple-rinse in deionised water. Rinsate samples were collected where necessary from reusable equipment to verify effectiveness of the decontamination.

5.3 Sediment Sampling Methodology

Sampling of sediment was completed in accordance with methodology detailed in **Table 9**.

Table 10. Soil Sampling Methodology

Action	Description
Permit to Work	Sediment sampling was completed under a Site Permit to Work (PTW) and a Digging, Excavation and Building Penetration Checklist. Permits were obtained in accordance with the CS Energy Permit to Work Manual (CS-PTW-01) and Digging, Excavation and Building Penetration (CS-PTW-HAZ-04) prior to the commencement of works.
Sediment Sampling	Sediments from drainage lines (including the EDC) were collected by hand using a new nitrile glove at each location, targeting a depth of approximately 100-150mm below the top of the sediment. Where deeper profiles were observed, sampling was completed by hand auger or test pit as detailed below.
Field QA/QC	Field intra- and inter-laboratory duplicates of soil samples were prepared in the field by collecting blind and split samples from the same depth. Duplicate sample pairs were collected and analysed at a rate of 1 in every 10 primary samples in accordance with the PFAS NEMP.
Decontamination	Soil sampling was completed using dedicated disposable equipment (pushtubes) along with decontaminated solid flight augers, and a hand auger where access was limited. Reusable equipment was decontaminated by hand between each sampling location and event which included scrubbing thoroughly with a plastic brush and rinsing with clean water followed by a triple-rinse in deionised water. Rinsate samples were collected where necessary from reusable equipment to verify effectiveness of the decontamination.

5.4 Surface Water Sampling Methodology

Sampling of surface water was completed in accordance with methodology detailed in **Table 11**.

Table 11. Surface Water Sampling Methodology

Action	Description
Sampling Timing	Surface water sampling was completed on a quarterly, seasonal (wet/dry) or annual basis in accordance with the sampling schedule in **Section 5.1**. Additionally, event-based sampling was to occur within 72 hours of a rain event >25mm (recorded onsite) to a maximum of one event per month.
Surface Water Depth Monitoring (Northern Boundary)	Monitoring of surface water flow has been completed through the installation of LoRaWAN Distance Detection Sensor: LDDS75. The sensor was used to detect the distance between the measured object (water level) and the sensor.
Surface Water Sampling	Surface water sampling was conducted using a decontaminated telescopic sampling pole or by directly submerging laboratory PFAS compliant containers into the water body. Samples were collected in laboratory prepared sample bottles attached to the pole with the lid open and lowered with the opening facing downwards into the water. Where possible the sample bottle was lowered to at least 30cm beneath the water surface and at least 30cm from the base of the water body, with care taken not to disturb any sediments during this process. The sample bottle was then rotated so as to sample water

	from the centre of the water column. Once full, the bottle was carefully removed and sealed. Where suspended solids were observed within the recovered sample, it was allowed to settle prior to decanting into a separate laboratory prepared bottle. Water quality parameters recorded in the field included dissolved oxygen, temperature, EC, redox potential, turbidity and pH, measured using a calibrated water quality meter.
Field QA/QC	Field intra- and inter-laboratory duplicates of the surface water samples were collected in the field by collecting blind and split samples from the same location. Duplicate sample pairs were collected and analysed at a rate of 1 in every 10 primary samples in accordance with the PFAS NEMP.
Sample Labelling, Storage and Transport	All samples were clearly labelled with unique identification numbers consisting of the date, sample location and samplers' initials. Samples were then bagged and kept in an ice filled Esky prior to dispatch and during transport to the NATA registered laboratory, under chain-of-custody procedures. By prior arrangement with the laboratory, samples were extracted and analysed as soon as practicable after receipt.
Decontamination	Reusable equipment was decontaminated by hand between each surface water sampling location by scrubbing thoroughly with a plastic brush and rinsing with clean water and a triple-rinse in deionised water. If required, equipment was scrubbed with a solution of Liquinox (a PFAS approved detergent) followed by a rinse in deionised water.

5.5 Groundwater Sampling Methodology

Sampling of groundwater was completed in accordance with methodology detailed in **Table 12**.

Table 12. Groundwater Sampling Methodology

Action	Description
Groundwater Bore Installation	Groundwater bore construction was undertaken by an appropriately licenced driller and was consistent with the Minimum Construction Requirements for Water Bores in Australia (National Uniform Drillers Licensing Committee (NUDLC) 2020). Groundwater bore construction details are provided on the Epic borelogs in **Appendix I**.
Groundwater Bore Development	The groundwater bores were developed using an electric submersible centrifugal pump to remove sediment load and encourage connectivity with the surrounding aquifer matrix. A minimum of five bore volumes was removed, with wells developed until physicochemical parameters stabilised[A]. Groundwater development sheets are provided in **Appendix J**.
Groundwater Bore Surveying	Groundwater bores were surveyed by a licenced surveyor to enable accurate measurement of standing water levels (SWL) in m Australian Height Datum (AHD).
Sampling Timing	Groundwater sampling was completed on a quarterly, seasonal (wet/dry) or annual basis in accordance with the sampling schedule in **Section 5.1**
Monitoring Well Gauging	Measurement of the SWL was completed at each groundwater monitoring well using an electronic interface probe prior to the commencement of purging. SWL was measured throughout groundwater bore purging to enable the minimisation of drawdown. Due to the pre-existing headworks present on landholder bores (L005-B01, L006-B05, L012-B01 and L021-G01), the SWL could not be measured at these locations.
Monitoring Well Sampling – CS Energy and DRDMW wells	Sampling of existing groundwater monitoring wells was completed utilising appropriate sampling methods based on the findings of the groundwater monitoring network review (Epic 2022c). Sampling methods included High Density Polyethylene (HDPE) HydraSleeves™ or a submersible pump in accordance with the methods outlined below. Sampling methodologies for new groundwater monitoring wells were determined in accordance with Epic 2022c.
	Sampling of monitoring wells utilising HDPE HydraSleeves™ (MW40, MW49, MW74, MW75, MW79, MW80, ESC4[6]) was completed as follows: • Groundwater depth and total well depth were measured and recorded to determine the appropriate length of bail cord to ensure the HydraSleeve™ was positioned a sleeve-length below the top of the screen interval • The HydraSleeve™ was lowered into the well slowly (less than 15 cm per second) to prevent water entering the HydraSleeve™ prematurely

[6] Refer Sections 7.1.1, 7.5.1 and Appendix H of the CLID (Epic, 2022c)

Action	Description
	• The HydraSleeve™ was left at depth in the well for at least 24 hours to allow for stabilisation • Following the stabilisation period, the HydraSleeve™ was recovered from the well by pulling the cord upward at a rate of approximately 30 cm per second, allowing the top check valve to open and groundwater within the screened well casing to enter the HydraSleeve™ (the check valve closes when the HydraSleeve™ is full) • Samples were collected by transferring the groundwater from the HydraSleeve™ to sample bottles by piercing the sleeve (approximately 1/3 of the way from the base) with the provided disposable High Density Polyethylene (HDPE) straw. Where suspended solids were observed within the HydraSleeve™, it was allowed to settle prior to decanting. • Samples were collected directly from the HydraSleeve™ into laboratory prepared bottles. All bottles were sealed immediately using a non-Teflon lined cap (for PFAS), labelled and placed on ice (double bagged).
	Sampling of groundwater monitoring wells utilising low flow techniques was completed as follows: • The pump inlet was set within the screened interval of the well during purging and sampling • Prior to sampling, monitoring wells were purged using a submersible pump at a rate <1 L/min • Continuous monitoring of the water level was completed with an interface probe during purging and sampling, with pumping rates adjusted to ensure minimal drawdown • Purging continued with frequent water quality measurements recorded until parameters stabilised • Sampling of the monitoring wells was completed using the submersible pump and dedicated HDPE tubing following stabilisation [A]. Samples were collected directly from the tubing into laboratory prepared bottles. All bottles were sealed immediately using a non-Teflon lined cap (for PFAS), labelled and placed on ice (double bagged). • Where suspended solids were observed within the recovered sample, it was allowed to settle prior to decanting into a separate laboratory prepared bottle.
	Sampling of groundwater monitoring wells using a submersible pump was completed as follows: • The pump inlet was set within the screened interval of the well during purging and sampling • Prior to sampling, monitoring wells were purged using a submersible pump. • Purging continued with frequent measurements of the water quality until parameters stabilised [A] or the well was purged dry. • Sampling of the monitoring wells was completed using the submersible pump and dedicated HDPE tubing following stabilisation or recovery (where purged dry). Samples were collected directly from the tubing into laboratory prepared bottles. All bottles were sealed immediately using a non-Teflon lined cap (for PFAS), labelled and placed on ice (double bagged). • Where suspended solids were observed within the recovered sample, it was allowed to settle prior to decanting into a separate laboratory prepared bottle
Monitoring Well Sampling – Private Abstraction Wells	Samples at private wells were collected as follows: • Samples were collected directly from the bore pump at the nearest tap or suitable outlet. Prior to sampling, the pipework was purged with a minimum of one well volume removed (if well volume known) or by purging for at least 10 minutes prior to sampling. • Samples were collected directly from the outlet into laboratory prepared bottles. All bottles were sealed immediately using a non-Teflon lined cap (for PFAS), labelled and placed on ice (double bagged).
Field QA/QC	Field intra- and inter-laboratory duplicates of the groundwater samples were prepared in the field by collecting blind and split samples from the location. Duplicate sample pairs

Action	Description
	were collected and analysed at a rate of 1 in every 10 primary samples in accordance with the PFAS NEMP.
Sample Labelling, Storage and Transport	All samples were clearly labelled with unique identification numbers consisting of the date, sample location and samplers' initials. Samples were then bagged and kept in an ice filled esky prior to dispatch and during transport to the NATA registered laboratory, under chain-of-custody procedures.
Decontamination	Reusable equipment, including the water level meter and groundwater pumps, were decontaminated by hand between each groundwater sampling location by scrubbing thoroughly with a plastic brush and rinsing with clean water and a triple-rinse in deionised water.

Notes: [A] – Stabilisation determined based on three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Groundwater Sampling Procedures, April 1996 (ref. EPA/540/S-95/504) including ±0.1 pH, ±3% EC, ±10 millivolts (mv) Oxidation-reduction potential (ORP) and ± 10% Dissolved Oxygen (DO).

6 ASH DAM 4 (DATA GAP 1)

Previous investigations completed at Ash Dam 4 (AD4) reported concentrations of PFAS above the laboratory's Limit of Reporting (LOR) in five of the 17 samples analysed, with one sample (AD401-0.5) reported above the ecological indirect criteria of 0.01 mg/kg (refer to previous investigation in Table 13). It was reported that areas of AD4 adjacent to bore AD401 were used to dispose road sweeping and vacuum excavation spoil, with PFAS concentrations reported at this location considered to be associated with localised disposal of spoil from these activities. Results from sediment sampling completed from the coal plant (located east of AD4)/AD4 drainage line supported that a localised source of PFAS may be present within AD4.

An additional soil investigation was undertaken at AD4 in accordance with the addendum SAQP (Epic 2023a, **Appendix L**) to determine the nature and extent of potential impacts at AD4.

A summary of the identified data gap and background information associated with the AD4 investigation is presented in **Table 13**.

Table 13. Ash Dam 4 (Data Gap 1) Summary

Information sourced from Addendum SAQP (Epic, 2023a) and CLID (Epic, 2022c)

Aspect	Details
Initial CLID Data Gap (Epic, 2022c)	Results from soil and sediment investigations at AD4 indicate that a localised source of PFAS may be present within AD4. Further investigation will be required to determine the nature and extent of potential impacts at AD4.
Initial CLID Recommendation (Epic, 2022c)	Further investigation should be undertaken at AD4 to confirm the nature and extent of PFAS impacts identified in soil and sediment. Results of the investigation should be used to inform any remediation, mitigation or management measures to be implemented to prevent or minimise potential ongoing risks to ecological and human health receptors (noting AD4 is located within the Waste Containment Facility (WCF), upstream of Ash Dam B).
Background and History	AD4 was commissioned in 1979 to service Callide A Power Station, transitioning to service Callide B in approximately 1988. AD4 remains part of the ash/water management of Callide B Power Station. AD4 is located within the WCF (**Figure F1**) and is reported to have had a capacity of approximately 1,200 megalitres (ML), with the crest of the dam wall located at 239.5 m AHD and a total depth of approximately 10 m. The spillway for AD4 is located at 238.5 m, with surface water and potential seepage discharging to the northern end of the Drains Reclaim Dam (DRD). Notably, the Environmental Authority (EA, EPPR 00536313) for the site authorises the release of ash and effluent to the WCF, where AD4 is located, from the following sources: • The sedimentation dams • Effluent from the chemical drains • Demineralisation and treatment plant • Callide C blowdown water • Cooling tower blowdown • Effluent from chemical cleans • Washdown waters • Quantities of oils and petroleum products that will not cause environmental harm • Dirty drains • Boiler blowdown • Blowdown water treatment plant • Ash Dam B seepage pond waters • Coal plant wastes • Cooling tower sludges • Waste ion exchange resins • Bag filters (and including the bag filters) • Laboratory drains • Callide A and B station sewage effluent
Previous Investigation	Intrusive investigation of AD4 was completed through three boreholes (AD401-03) as part of the EE scope of works (Epic, 2022c), with its location shown in **Figure F4**. These bores were placed to target the northern, central and southern ash disposal areas. A summary of the investigation is as follows:

- From the samples collected, one (AD401-0.5) reported concentrations of PFOS (0.0143 mg/kg) above the ecological indirect criteria of 0.01 mg/kg, with Sum of PFOS and PFHxS (0.0155 mg/kg) exceeding the HIL-A criteria of 0.01 mg/kg, but below the HIL-D criteria. Sample AD401-0.5 also reported detection of PFHxA (0.0004 mg/kg).
  - It is understood that areas of AD4, adjacent to bore AD401, are used to dispose road sweeping and vacuum excavation spoil generated from across current operational areas of the site.
  - It was concluded that PFAS concentrations likely to be associated with disposal of other materials/wastes in accordance with EA, rather than impacts within the ash material.
- Results from the sediment collected in drainage channels adjacent to coal stockpile / Coal Plant (upstream) and AD4 (downstream) reported an increase in PFAS concentrations and change in PFAS composition between both locations (**Figure 2**).
  - All results were reported below the adopted assessment criteria of 0.01 mg/kg (Sum of PFOS and PFHxS), however results indicated that a localised source of PFAS may be present within AD4 noting elevated concentrations of PFAS in sediments within the AD4 drainage channel (refer **Figure 2**).
  - It was noted that soil investigations reported elevated concentrations of PFAS in the north-eastern corner of AD4, which may be associated with these PFAS detected in sediments. It is also noted that overland flow from the waste oil store and western areas of the Coal Plant can drain towards these drains surrounding AD4.

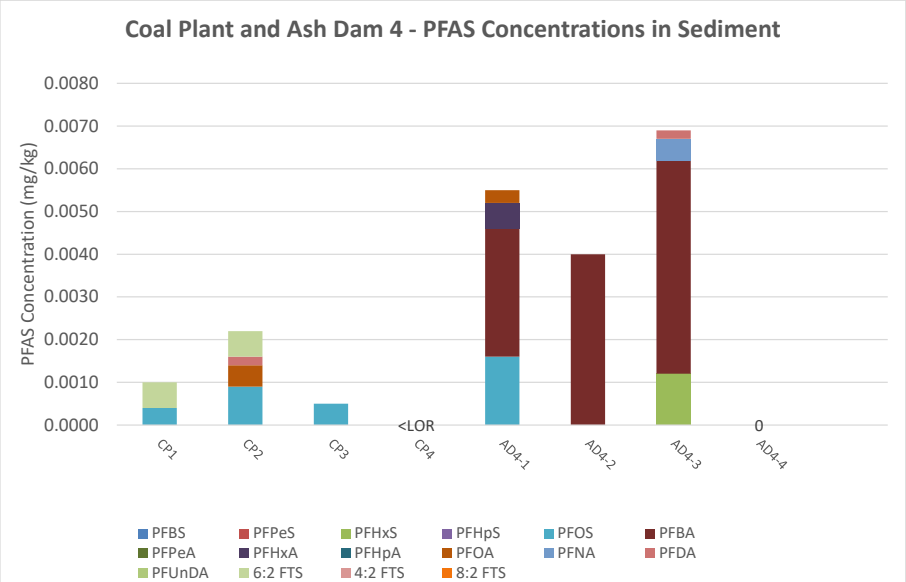
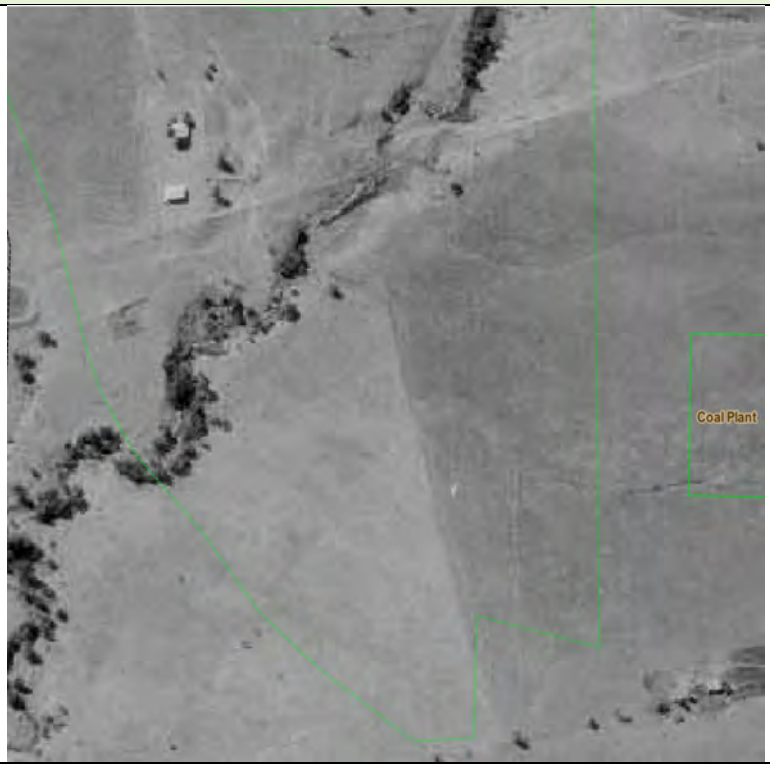


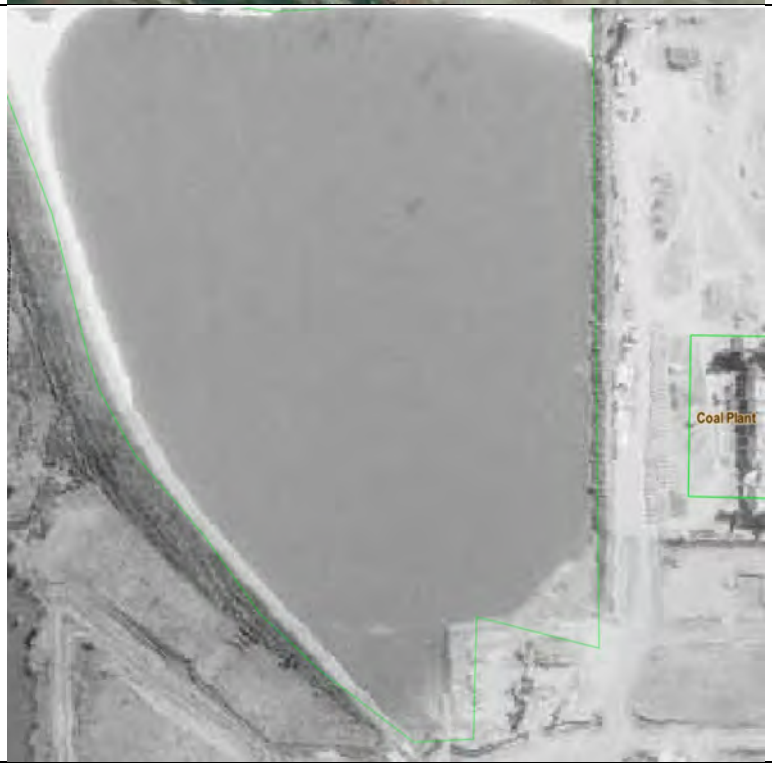
Figure 2. Coal Plant and AD4 – PFAS Concentration in Sediment (Epic, 2022c)

Historical Aerial Photograph Review	As the filling history of AD4 is unclear, a supplementary historical aerial image review was completed to identify the nature of filling and identify any areas of interest. A summary of this review is presented in **Table 14** with the full historical aerials presented in the addendum SAQP (Epic 2023a) included as **Appendix L**. Based upon this review, the following areas of interest were identified for further investigation: • AD4 was built over the former alignment of Suicide Gully (imagery from 1977 – 1981) • Potentially bunded pads (imagery from 1999) filled with a potential slurry of unknown nature • Nature of material used for the construction of the internal dam wall (imagery from 2004) • Machinery storage immediately north of the belt conveyor tower (imagery from 2012) • Potential use of AD4 as a temporary coal stockpile (imagery from 2017) with the potential for spontaneous combustion requiring extinguishment • Windrowed material stockpiles of a distinct red/orange colour (imagery from 2021)

Table 14. Historical Aerial Review: AD4

Table reproduced from Addendum SAQP (Epic 2023a)

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1977		Callide B Power Station has not been constructed. The area prior to the construction of the station is primarily used for grazing with small structures (potential house and shed) located north of the watercourse. The watercourse of Suicide Gully is visible bisecting the area of AD4.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1981		The dam walls associated with AD4 are being constructed with significant amount of earthworks visible to the south and east of the dam. Potential cenospheres are visible floating on the surface along the margins of the dam, potentially from Callide A. The watercourse of Suicide Gully has been filled in and is no longer visible.
1984		Construction of the adjacent areas is continuing and has extended further north. Construction of the coal plant has commenced. A larger volume of water is present within the dam identifiable by the inundation of the northern section of the dam, previously visible.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1988		Construction of the adjacent areas are complete with the belt conveyor and coal plant visible. Potential bottom ash (dark grey) is visible filling the northeastern and eastern margins of the dam, with the lighter cenospheres visible across the surface of the water.
1994		Progressive filling of the dam has continued with the volume of water reduced. A darker coloured material (potentially carbonaceous) is filling the dam in the northern and southern areas.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1999		Filling has continued of the dam, with water confined to the western margin of the dam. Two bunded areas (red) are visible in the eastern area of the dam with an unknown material used to fill the area. Vegetation regrowth across the surface of the filled dam is visible in the north and southern areas.
2004		Construction of an internal dam wall is visible with earthworks highlighted in red. A belt conveyor extension has been built in the southern corner of the dam, likely associated with the operations at Callide C. The surface area of water has continued to reduce, and a brown discharge is visible from a potential outlet in the southwest corner of the dam.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
2012		Filling of the internally constructed dam has continued, likely with ash (grey) and carbonaceous material (black). Vegetation regrowth has continued at the top of the ash dam. Machinery and mechanical parts are visible north of the belt conveyor tower (Red). A water course has been excavated in the northern area of the dam.
2017		Stockpiling of coal is visible in the eastern portion of AD4.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
2021		The watercourse in the northern portion of the dam has been filled and has been channelised linking to the remaining water body in the west of the dam. Windrowed stockpiles of soil are visible in the north (red), unlikely to be ash based upon colour.

6.1 AD4 Investigation Scope

Soil sampling was undertaken in accordance with the addendum SAQP (Epic 2023a), with the sampling methodology adopted outlined in **Section 5** (**Table 9**). Sampling was completed on 30 and 31 May 2023, with details on soil investigation locations presented in **Table 15.** Soil investigation locations are presented on **Figure F4** with soil bore logs provided in **Appendix I** and laboratory documentation provided in **Appendix K**.

Table 15. AD4 Additional Soil Investigation Scope

Investigation Area/Target	Identified Risk/Target	Sample Details
Former Suicide Gully	Area north of the current stormwater channel to characterise filling of the historic Suicide Gully	• Four bores (AD409, AD410, AD411 and AD412) drilled in the northern extent of AD4 (north of the coal plant stormwater drain) to depths between 4.8 – 8.0 m • Three bores (AD409, AD410 and AD412) drilled from the side of existing roadways due to access constraints • Two bores (AD410 and AD411) completed using a combination of pushtubes (to 4.8 m depth) and solid flight augers (to termination depths of 6.0 m and 8.0 m depth respectively)
AD402	Area between AD401 and AD402 to delineate the concentrations detected in AD402	• Two bores (AD404 and AD405) drilled west/southwest of AD401 to the target depth of 10 m.
Windrowed Stockpiles (2021)	Area of windrowed stockpiles (2021) identified in the historical aerial imagery review	• One bore (AD414) drilled adjacent to windrow area to the target depth of 10 m. • One surface sample (AD413) collected from windrowed material
Western Area	Western area of AD4 to provide additional characterisation	• One bore (AD415) drilled along westernmost portion of current ash fill platform (approximate

Investigation Area/Target	Identified Risk/Target	Sample Details
		location of internal dam wall observed in 2004 aerial photograph) • Bore AD415 completed using combination of pushtubes (to 4.8 m depth) and solid flight augers (to termination depth of 10.0 m)
Machinery Storage (2012)	Area formally used for storage of machinery (2012) identified in the historical aerial imagery review	• One bore (AD406) drilled in area of former machinery storage • Bore AD406 completed using combination of pushtubes (to 4.8 m depth) and solid flight augers (to termination depth of 9.0 m)
Bunded Areas (1999)	Potentially bunded area identified in the 1999 historical aerial imagery review	• Two bores (AD407 and AD408) drilled targeting the northern (AD408) and southern (AD407) bunded areas visible in the 1999 aerial photograph. Bore AD408 also completed between AD401 and AD402 • Both AD407 and AD408 completed using combination of pushtubes (to 4.8 m depth) and solid flight augers (to termination depth of 10.0 m)

6.1.1 Deviations from the Addendum SAQP

Due to access restrictions as noted in **Table 15**, the proposed addendum SAQP locations were modified to areas accessible using a 4WD mounted drilling rig. One surface sample (AD413) was collected from windrowed material located in the area of proposed bore AD413. Due to the presence of windrowed soil material, the area was unable to be accessed by the drilling rig.

6.1.2 Field QA/QC

Duplicate sample pairs were collected and analysed at a rate of 1 in every 10 primary samples as part of the wider investigation scope in accordance with the PFAS NEMP (refer **Section 4**), with 3 duplicate pairs collected for a total of 26 primary samples collected during additional investigations at AD4. Further discussion of field duplicates is presented in **Appendix F**.

6.2 AD4 Observations and Analytical Results

Soil analytical results are presented in **Table T5**, with a summary of results presented in **Table 16**. Further discussion on investigation findings is presented in **Section 6.3**. Historical investigation results from AD4 are presented in **Table T4** (sediment) and **Table T5** (soil).

Table 16. AD4 Soil Investigation Results Summary

Investigation Scope	Identified Risk/Target	Observations	Analytical Results
Initial CLID Soil Investigation (June 2022)	Assessment of potential residual PFAS impacts in ash material and other site generated wastes disposed in Ash Dam 4	Investigation locations within Ash Dam 4 encountered a discontinuous alternating profile of pumped ash, bottom ash (with slag), carbonaceous clays and coal to a maximum depth of 8.4 m (AD401) to greater than 10 m in AD402 and AD403 (limit of investigation). Saturated conditions were encountered between 3.5 and 4.0 m, perched on top of the underlying natural clays (only encountered in AD401).	• All locations reported concentrations of PFAS above the LOR, with concentrations reported below the assessment criteria • AD401-0.5 located in the north-eastern corner of Ash Dam 4 reported concentrations of Sum of PFOS and PFHxS above the HIL-A criteria, but below the HIL-D criteria • Both AD401 and AD402 reported detectable concentrations of PFHxS and PFOS. Additionally, AD401 reported concentrations of PFHxA • AD403 only reported detectable concentrations of PFOS
Addendum CLID Soil Investigation (May 2023)	Targeted assessment of potential PFAS impacts in Ash Dam 4, including delineation of elevated PFAS reported at AD401	Investigation locations reported similar ground conditions to previous investigations with discontinuous alternating profiles of ash. Clays, gravelly clays and rock were reported at the base of the ash profile in the majority of locations between 3.4 m (AD409) and 9.7m (AD404) depths, with AD414 and AD415 reporting ash profiles >10 m depth (target depth). Saturated conditions were generally reported at a depth of approximately 4.0 to 4.5 m, however observations in AD409, AD410 and AD408 reported saturated layers at 2.0 m, 3.0 m and 9.0 m depths respectively.	• One or more PFAS compound was reported at or above the laboratory's LOR in AD404 (3.0 m), AD406 (0.5 m and 4.5 m), AD407 (4.0 m), AD410 (2.0 m), AD13 (0.2 m) and AD14 (2.0 m), with all samples below the assessment criteria • All sampling reporting detections of PFAS reported the presence of PFOS, with sample AD404-3.0 reporting detections of PFOS and PFHxA, sample AD405-4.0 reporting detections of PFHxS, PFOS, PFPeA and PFHxA and sample AD414-2.0 reporting detections of PFHxS and PFOS • On the basis that all analytical results were reported below the assessment criteria and previous investigation results additional analytical methods (i.e. TOPA, TOF) were not completed

6.3 AD4 Results Discussion

Review of analytical results for samples collected from AD4 during investigations in June 2022 and May 2023 report detections of PFAS above the laboratory's LOR in 12 of the 43 samples collected. All 12 samples reported detections of PFOS, with samples also reporting detections of PFHxS (6 samples), PFPeA (1 sample) and PFHxA (4 samples).

Comparison of soil investigation results with sediment samples from the adjacent drainage channel indicates that ash and soil materials within AD4 are unlikely to be the source (or sole source) of elevated concentrations observed in sediments. It is noted that whilst sediment samples reported PFBA as the major constituent (and a potentially different PFAS composition when compared to soil samples which reported PFOS as the major constituent, refer **Figure 3**), raised LORs for PFOS were reported in AD4-3 (0.0087 mg/kg) and AD4-4 (0.0036 mg/kg) due to matrix interference, which limit the ability to directly compare results. It is noted that raised LORs were reported in samples with high moisture content (>50%).

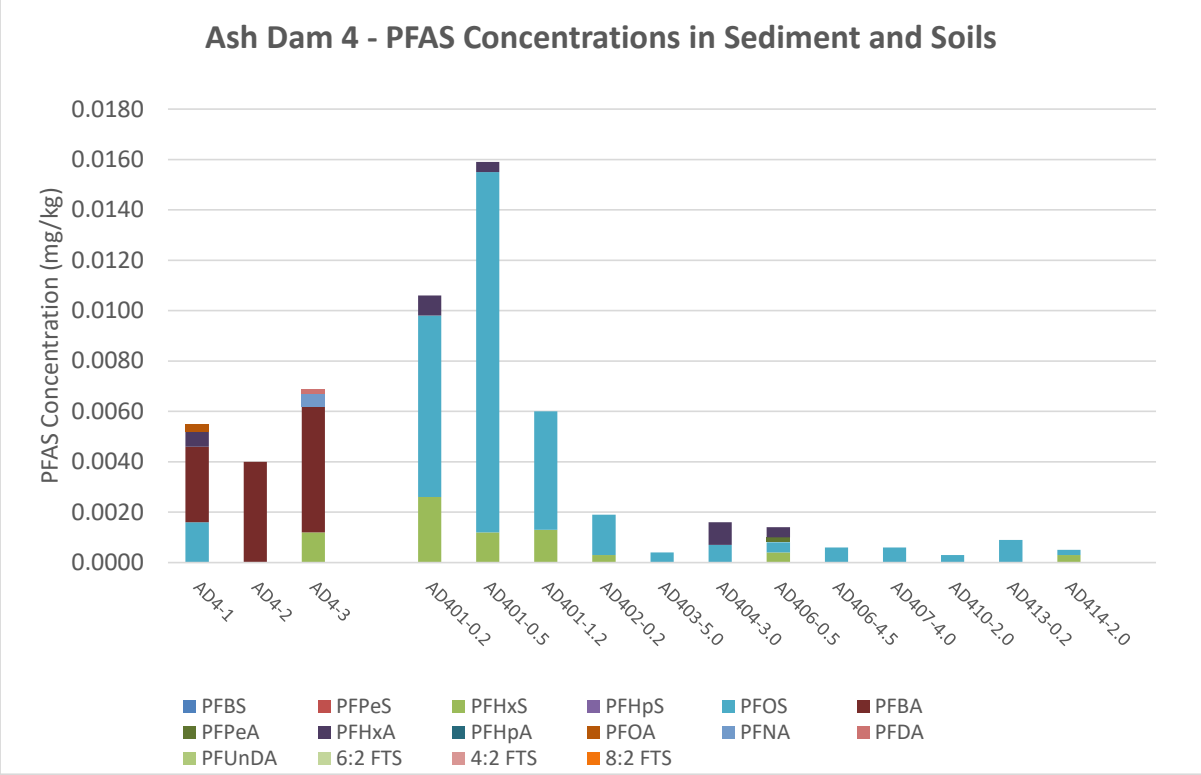


Figure 3. AD4 – PFAS Concentration in Sediments (AD4-1 to AD-3) and Soils (AD401 to AD414)

Results from the current investigation support previous conclusions that in general, ash materials located across the site contain low concentrations of PFAS and are unlikely to comprise a significant source of PFAS. Ash material located within ash disposal areas (including AD4) are considered to contain low concentrations of PFAS consistent with current and historical operational practices which have included the use of site generated water to slurry ash for placement within the WCF, with the results indicating that PFAS impacts are limited and localised (i.e. results from AD401).

7 CALLIDE A (DATA GAPS 2 AND 3)

Previous investigations completed at Callide A reported concentrations of PFAS above the laboratory's LOR at three of the 18 investigation locations, with borehole CA15, located within the Northern Stormwater Pond (NSP) reporting concentrations of PFOS (0.0552 mg/kg) above the ecological indirect criteria, and Sum of PFOS and PFHxS (0.0624 mg/kg) above the HIL-A criteria, but below the HIL-D criteria.

Additional investigation was undertaken at Callide A in accordance with the addendum SAQP (Epic 2023a, **Appendix L**) to determine the nature and extent of potential impacts associated with the northern stormwater pond and confirm potential linkages with surface water discharges to Dunn Creek.

A summary of the identified data gap and background information associated with the Callide A investigation is presented in **Table 17**.

Table 17. Callide A (Data Gap 2 and 3) Summary

Information sourced from Addendum SAQP (Epic, 2023a) and CLID (Epic, 2022c)

Aspect	Details
Initial CLID Data Gap (Epic, 2022c)	**Data Gap 2:** Soil investigations completed at Callide A indicate a localised PFAS impact may be present within the catchment of the Northern Stormwater Pond (NSP), with elevated concentrations of PFAS reported in soils (coal ash/dust) within the NSP along with surface water. Further investigation will be required to determine the nature and extent of potential impacts at the Callide A NSP. **Data Gap 3:** PFAS is reported to be present in Dunn Creek, with results indicating that discharges from the Callide A site (via release point R2) are likely to be contributing to PFAS concentrations, noting limited water is released via R2 and PFAS impacts were also reported in upstream surface water within Dunn Creek (downgradient of the Callide Mine). No PFAS was identified in ash (soil samples) within Ash Dam 2 or the majority of soil samples collected at Callide A, with PFAS reported at R2 likely associated with soil impacts identified at the NSP. Further investigation will be required to confirm the source of PFAS reported within R2.
Initial CLID Recommendation (Epic, 2022c)	Further investigation should be undertaken at Callide A to determine the nature and extent of PFAS impacts identified in the NSP and confirm potential linkages with surface water discharges to Dunn Creek. Results of the investigation should be used to inform any remediation, mitigation or management measures to be implemented to prevent or minimise releases of PFAS from the Callide A site.
Background and History	Callide A Power Station is located in the north-eastern portion of the site and is located on a small ridgeline that borders Dunn Creek. Ash disposal areas (Ash Dams 1 and 2) are located to the south-west and north-east respectively of the main structure.

Previous Investigation	Soil sampling completed at Callide A as part of the initial CLID (Epic, 2022c) indicated a localised PFAS impact may be present within the catchment of the NSP, with elevated concentrations of PFAS reported in soils (coal ash/dust) within the NSP along with surface water. These results included:
	• No PFAS was identified in ash (soil samples) within Ash Dam 2 or the majority of soil samples collected at Callide A with the exception of CA04, CA10 and CA15
	• PFAS concentrations were above the laboratory's LOR at three locations, CA04 (former pump house), CA10 (laydown area) and CA15 (NSP). A summary of the results includes:
	  • Results from CA04 (pump house) reported concentrations of PFOS at the LOR of 0.0002 mg/kg at the surface, with all other compounds reported below the laboratory's LOR, and no PFAS detected in deeper samples. Surrounding samples (CA02, CA05 and CA06) also reported concentrations of PFAS below the laboratory's LOR indicating PFAS detected at CA04 is unlikely to represent a significant source of PFAS.
	  • Results from CA10 (Oxyfuel laydown area) reported detections of PFHxA, PFHpA and PFOA, with a total PFAS concentration of 0.0007 mg/kg. Activities completed at the laydown area are unknown, with results indicating minor PFAS impacts may be present. It is noted that surface water sampling completed at the Eastern Stormwater Pond (**Figure 4** and **Figure 5**) (downstream of CA10) reports concentrations of Perfluoroalkyl Carboxylic Acids (PCAs) including PFHxA, PFHpA and PFOA above the laboratory's LOR, along with PFOS and PFHxS.

	• Borehole CA15 was drilled within the NSP, with site observations reporting layers of coal ash/dust approximately 1.0 m deep and assumed to comprise runoff from the adjacent coal stockpile and coal hopper. The 0.5 m sample reported concentrations of PFOS (0.0552 mg/kg) above the ecological indirect criteria and Sum of PFOS and PFHxS (0.0624 mg/kg) above the HIL-A criteria but below the HIL-D criteria. Site history information (Epic, 2022c) indicates AFFF usage at Callide A was likely to be limited to use of portable foam-type extinguishers (blue band) and/or use of fire control on the coal stockpile, with results indicating localised PFAS impacts may be present within the catchment of the NSP. • Surface water concentrations of PFAS were reported to be present in Dunn Creek, with results indicating that discharges from the Callide A site (via release point R2) are likely to be contributing to PFAS concentrations. A summary of the results included: • Concentrations of PFAS have been reported in all sample locations within Dunn Creek (SW18, SW17 and SW43), with highest concentrations reported in the upstream sample (SW18) (refer **Figure 5**). Most samples collected within Dunn Creek reported concentrations of PFOS above the 95% species protection limit and concentrations of Sum of PFOS and PFHxS above the drinking water criteria. Concentrations are generally reported to decrease along the alignment of Dunn Creek, with concentrations of total PFAS in upstream surface water (SW18) reported between 0.225 – 0.244 µg/L and downstream surface water (SW42) reporting concentrations between <0.0031 – 0.1250 µg/L. • PFAS concentrations within Callide Dam at the mouth of Dunn Creek (SW36) have been reported below the laboratory's LOR during each of the five monitoring events completed. However, it is also noted that LORs have been raised in all samples (PFOS LOR of <0.0008 - <0.00016 µg/L). • PFAS has been reported within the Northern (SW44, total PFAS 0.0054 – 0.0561 µg/L) and Eastern (SW43, total PFAS 0.003 – 0.0192 µg/L) Stormwater Ponds, along with the Callide A release point (R2) into Dunn Creek (total PFAS <0.0032 – 0.202 µg/L). Concentrations of PFAS at R2 were reported to be variable, however concentrations were lower than those observed downstream in Dunn Creek SW17 when sampling was completed at both locations (Dec21 and Jan22, refer **Figure 5**). • No clear trend is observed with PFAS compositions (**Figure 4**), however some similarities are observed across events (i.e. SW18, SW17, SW42 and R2 during the December 2021 monitoring event). It is noted that SW44 and R2 were the only locations to report detection of 6:2 FTS (both at 0.002 µg/L, Oct21) which may indicate some linkage between these locations. • Surface water has also been noted to accumulate within the voids associated with the coal reclaim hopper which may represent a subsurface migration pathway for impacted waters (if any) • Groundwater bores installed surrounding Callide A have not reported a sufficient standing water level to facilitate sampling. As such, no data is available regarding the PFAS concentrations in groundwater (if any). It was recommended that additional investigation be done to determine the nature and extent of potential impacts at the Callide A NSP.

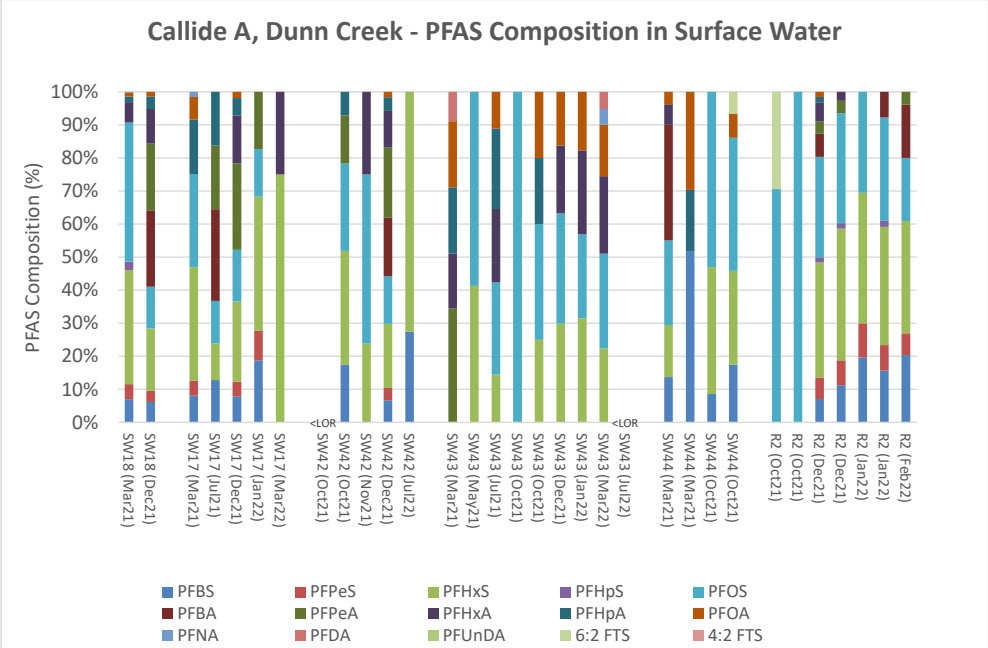


Figure 4. Callide A and Dunn Creek – PFAS Composition in Surface Water (Epic, 2022c)

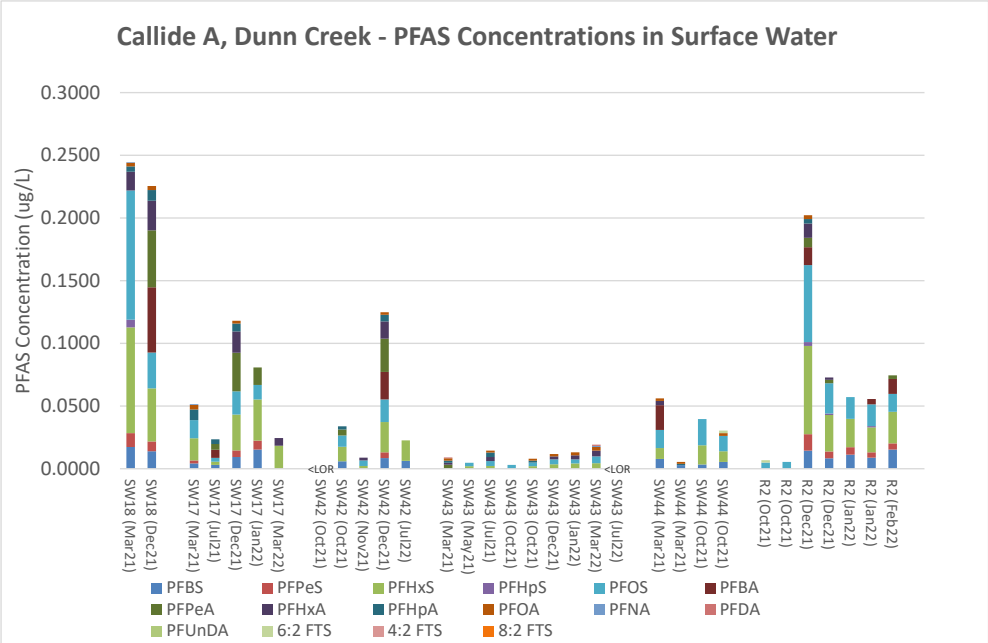


Figure 5. Callide A and Dunn Creek – PFAS Concentration in Surface Water (Epic, 2022c)

Historical Aerial Photograph Review	A review of historical aerials was completed of the catchment associated with the NSP. A summary of this review is presented below, with the complete historical aerial photograph review provided in the Addendum SAQP (Epic, 2023a) (**Appendix L**). The NSP was not visible in photographs prior to 1999, where the area was used for the stockpiling of coal. From this review, areas of interest were identified (2012) in the north-western corner of the site and stormwater channel linking the areas surrounding the ash hoppers with the NSP where white material was visibly being washed into the NSP, potentially mobilising impacted material from a historic discharge of a firefighting foam extinguisher into the pond. Additionally, areas of permanent moisture were identifiable in the northern area of Ash Dam 2 (deep rooted vegetation), which may be the result of infiltration from the NSP or spillway discharge from the NSP. These waters would then eventually discharge into R2 through seepage recovery in the ash dam walls, further corroborated with the findings of GHD (2022).
Ash Dam 2 Preliminary Dam Safety Review (GHD 2022)	GHD completed a preliminary dam safety review and environmental review for Ash Dam 2, with findings documented in a technical memorandum dated 6 September 2022. Key findings from the memorandum include: • Surface water at Callide A is directed to the northern and eastern stormwater ponds. During high rainfall events, water discharges from the ponds through an overflow structure to the wetland area of Ash Dam 2 • The wetland portion of Ash Dam 2 was reported to generally be dry, with MW19 located within the ash profile also generally reported to be dry • A possible preferential flow path through Ash Dam 2 may exist for surface water adjacent to the NSP (possibly from modification to the landform following establishment of the pond) as indicated by a stand of *melaleucas* trees (refer **Figure F5**) • CCTV inspection of the decant outlet pipe (connecting the wetland decant tower and R2) indicated some evidence of minor cracks and minor seepage, with two PVC pipes located at the base of the decant tower inferred to be the upstream ash filter drain pipes • Water flows and discharge from R2 appear to be occasional and likely to have a minimal impact on the receiving environment

7.1 Callide A Investigation Scope

Additional investigations were undertaken in accordance with the Addendum SAQP (Epic, 2023a) (**Appendix L**) and the methodology outlined in **Section 5** to identify and delineate potential secondary sources (if any) present within the NSP at Callide A, and to identify the data gap present in the understanding of potential connectivity of groundwater within Ash Dam 2. The investigation was completed from 31 May to 2 June 2023, with details on the sampling locations provided in **Table 18** and on **Figure F5**.

Table 18. Callide A Additional Investigation Scope

Investigation Area/Target	Identified Risk/Target	Sample Details
NSP	Delineate the extent of PFAS detected during the initial investigation and assess potential migration pathways	• Three soil boreholes (CA17, CA18, CA19) were advanced in the NSP area using primarily push tube methodology, with holes terminated at refusal (CA17 at 1.4 m, CA18 at 1.8 m and CA19 at 1.3 m) and soil samples collected throughout. • CA19 was drilled with a combination of push tube (0.0 – 0.6 m) and solid flight auger (0.6 – 1.3 m) methodology
	Drainage channel identified from historical aerial imagery review (2012) to be flowing towards the NSP	• Four surface soil samples (SS01 – SS04) were collected from within the drainage channel identified within the historical aerial imagery review (2012)
NSP/ R2	Installation of groundwater bores to investigate potential seepage pathways between the NSP and R2	• Seven soil boreholes (MW95#1, MW95#2, MW96#1, MW96#2, MW96#3, MW97, MW97#2) were advanced, targeting the eastern boundary of the NSP, and the permanent vegetation in the

Investigation Area/Target	Identified Risk/Target	Sample Details
		northern portion of Ash Dam 2 and between Ash Dam 2 and Dunn Creek • Multiple boreholes were advanced at each location due to encountering refusal at several locations • Groundwater bores were installed in MW96#3 and MW97 to 6.0 mbgl and 3.3 mbgl, respectively, with MW96#3 observed to be dry at 6.0 m depth • MW97 has been incorporated into the quarterly monitoring events • A groundwater bore was not installed at MW95 due to refusal before water strike
Coal Reclaim Hopper	Potential for PFAS contamination in water collected within the coal hoppers	• One water sample was collected from within the coal reclaim hoppers via the access stairs

7.1.1 Deviations from the Addendum SAQP

Soil boreholes were advanced by a utility-mounted drill rig utilising a combination of pushtube and solid flight auger methodologies. MW96 was installed to 6.0 m and MW97 to 3.3 m. PVC casing and factory-slotted screen were used to construct the monitoring wells, installed with gravel pack to a minimum of 1.0 m above the top of screen, a minimum 0.5m bentonite plug and grout to finish.

MW95 was not installed due to ground conditions encountered (shallow refusal and no water strike), and MW96 was installed dry at the target depth of 6.0 mbgl, noting that the base of the well is likely to be within the wall of AD2 (based on the proximity to the dam wall and stratigraphy encountered). A summary of investigation bores and monitoring wells installed is presented in **Table 19**.

Table 19. Callide A Ash Dam 2 Groundwater Bore Summary

Target Location	Bores Drilled	Depth (mbgl)	Water Strike?	Monitoring Well Installed?	Screened Geology	Stabilised Water Level (mbgl)
MW95	MW95#1	5.5 m (refusal)	No	No		
	MW95#2	3.0 m (refusal)	No	No		
MW96	MW96#1	3.0 m (refusal)	No	No		
	MW96#2	4.2 m (refusal)	No	No		
	MW96#3	6.0 m (target depth)	No	Yes (Screened 3.8 – 5.8 mbgl)	Gravelly Sandy Clay	Dry (14.06.23) Dry (09.12.23)
MW97	MW97	3.3 m (refusal)	Yes (2.8 mbgl)	Yes (Screened 1.8 – 3.3 mbgl)	Gravelly Clay/Clay	2.04 (17.06.23) 2.83 (08.09.23) Dry (09.12.23)
	MW97#2	1.8 m (refusal)	No	No		

Note: mbgl – meters below ground level

A water sample was collected from the coal reclaim hopper via the access stairs. Water was collected directly into laboratory supplied sample bottles (by hand via the access stairs), with the bottles sealed immediately upon collection of the sample.

Sampling from release point R2 was completed by CS Energy's environmental team on 1 and 16 December 2022 and 5, 11 and 18 January 2023 following a number of rainfall events. Samples were collected from within the concrete structure located at R2 (refer **Plate P17**) in general accordance with the methodology detailed in **Section 5.3**. Analytical results are tabulated in **Table T2** and **Table T3**.

7.1.2 Field QA/QC

Duplicate sample pairs were collected and analysed at a rate of one in every 10 primary samples as part of the wider investigation scope in accordance with the PFAS NEMP (refer **Section 4**), with one duplicate pair collected for a total of 21 primary samples (17 from bores and four surface samples) collected during additional investigations at Callide A. Due to the requirement for re-drilling each of the proposed groundwater monitoring bore locations, additional primary samples were collected, however, additional duplicate samples were not collected to meet the increased requirement.

It is noted that although duplicate sampling was not completed at the required rate for the current investigation, a total of five sets of duplicate pairs have been collected for a total of 45 primary samples collected from Callide A across all investigations. Further discussion of field duplicates is presented in **Appendix F.**

7.2 Observations and Analytical Results

Soil analytical results are presented in **Table T5**, with a summary of results presented in **Table 20**. Further discussion on investigation findings is presented in **Section 7.3**. Historical investigation results from Callide A are presented in **Table T1**, **Table T2** and **Table T3** (surface water), **Table T4** (sediment), **Table T5** (soil) and **Table T6** (leachate).

Table 20. Callide A Investigation Results Summary

Investigation Scope	Identified Risk/Target	Observations	Analytical Results
Initial CLID Soil Investigation (June 2022)	Assessment of potential PFAS impacts at former operational areas and ash disposal locations at Callide A	Soils surrounding the Callide A Power Station were typically a shallow reworked fill profile of dark brown clayey sand and light brown clays from 0.05m to 3.2 m in depth. Refusal on rock was encountered at all locations surrounding Callide A Power Station The NSP (CA15) encountered alternating layers of carbonaceous clay and clayey ash to 0.9 m, overlying reworked dark brown gravelly clays. Refusal on rock was encountered at 1.2m Ash Dam 1 comprised of a brown sandy clay cap 0.1 m to 0.2 m deep overlying an alternating pumped, lean phase and bottom ash layers to between 2.6 m (AD1-1) and 5.8 m (AD1-2), overlying dark brown sandy clays. Refusal on rock was encountered at both AD1-1 (2.9m) and AD1-2 (8.8m)	• All samples collected from Ash Dam 1 and Ash Dam 2 reported concentrations of PFAS below the laboratory's LOR. • PFAS was detected at three of the sixteen sampling locations at Callide A, CA04 (former pump house), CA10 (laydown area) and CA15 (NSP). • Results from CA04 (pump house) reported concentrations of PFOS at the LOR of 0.0002 mg/kg at the surface, with all other compounds reported below the laboratory's LOR. • Results from CA10 (laydown area) reported detections of PFHxA, PFHpA and PFOA, with a total PFAS concentration of 0.0007 mg/kg. • Results from CA15 reported concentrations of PFOS (0.0552 mg/kg) above the ecological indirect criteria and Sum of PFOS and PFHxS (0.0624 mg/kg) above the HIL-A criteria at 0.5 m depth but below the HIL-D criteria. PFOS was also reported at 0.0 m and 1.0 m depth, with results below the assessment criteria **TOPA Analytical Results** TOPA analysis was completed on samples for borehole CA15, with all samples reporting higher concentrations in post-TOPA samples. Comparison of TOPA and standard analytical results (**Table T9**) reported percentage increases of total PFAS between 18% (CA15-0.0) and 100% (CA15-0.5). On this basis, it is considered that an additional mass of PFAS precursors may be present in soils at CA15. **TOF Analytical Results** All samples reported concentrations below the laboratory's LOR of 1.0 mg/kg, however the LOR for TOF analysis exceeded the highest total PFAS concentration reported (0.0655 mg/kg [standard analysis]/0.1000 mg/kg [TOPA]).

Investigation Scope	Identified Risk/Target	Observations	Analytical Results
			Soil Leachability • Concentrations of PFHxS and PFOS were reported to be leachable in sample CA15-0.5, with leachable concentrations reported at 20% and 16% of the total concentration respectively (refer **Table T7**). • No other PFAS compounds were reported to be leachable from the samples analysed, noting that LORs were raised for a number of samples (0.016 to 0.080 µg/L).
Addendum EE Soil Investigation (May 2023)	Targeted assessment to delineate PFAS impacts identified during the original investigation and to investigate potential seepage pathways	Boreholes drilled within the NSP (CA17 to CA19) reported coal fines between 0.4 to 0.7 m depth overlying sandy and gravelly clays (possibly reworked natural) grading to rock between 1.3 to 1.8 m depth. The two bores drilled at the proposed location of MW95 reported a shallow discontinuous layer of coal fines, with a layer of ash observed in the northernmost location (MW95#1) between 2.0 and 3.6 mbgl. The southernmost location (MW95#2) reported clay soils between 0.4 to 3.0 mbgl where refusal was encountered. Due to the observed ground conditions, MW95 was not installed. Three bores were drilled in accessible areas surrounding the proposed location of MW96. Bore MW96#1 encountered natural soils and refusal on weathered rock at 3.0 mbgl. Bore MW96#2 reported a layer of ash between 0.6 and 1.0 mbgl, overlying clay soils to a depth of 4.2 m (refusal). Bore MW96#3 reported a similar lithology to bore #2, with the bore terminated at 6.0 m depth, and groundwater monitoring well MW96 constructed. MW97 was installed on the northern side of the AD2 embankment, in an area of potential	• PFAS in soil was detected at six locations sampled within Callide A including 3 boreholes (CA18, MW95, MW96/2) and 3 surface samples (CA-SS01, CA-SS02 and CA-SS04). The 3 boreholes only reported detections of PFOS (0.0002 to 0.0005 mg/kg), with the 3 surface samples reporting detections of PFOS, PFDA, PFUnDA and PFDoDA in at least one of the samples. • All soil investigation results were reported below the adopted assessment criteria and historical maximums reported at Callide A. It is noted that previous investigations at Callide A (soil, sediment and surface water) have not reported detections of PFUnDA and PFDoDA, with PFDA only previously detected in surface water at the Northern (SW44) and Eastern (SW43) Stormwater Ponds. • Water collected from the base of the coal hopper reported detection of PFOS, PFBA and PFOA, with PFBA (0.0311 µg/L) comprising the majority of the total concentration reported (0.0331 µg/L). Concentrations of PFOS (0.001 µg/L) were reported above the 99% Species Protection limit of 0.00023 µg/L. It is noted that a number of compounds were reported at a raised LOR (0.0007 to 0.0016 µg/L). • Groundwater was not encountered in MW96, with the well dry following installation and during inspections completed in June, September and December 2023. A groundwater monitoring well was not installed at the location of MW95 due to shallow refusal • Sampling from MW97 was completed in June and September 2023, with the well reported to be dry in December 2023. Concentrations of PFOS (0.0177 and 0.0205 µg/L respectively) were reported above the 99% Species Protection limit of 0.00023 µg/L, with concentrations of the sum of PFOS and PFHxS (0.0225

Investigation Scope	Identified Risk/Target	Observations	Analytical Results
		seepage (as evidenced by green vegetation). Two bores were attempted, with MW97#1 converted to a groundwater monitoring well. Both locations reported similar lithologies, comprising sandy clays grading to rock and refusal at approximately 3.3 mbgl. Moisture was observed at approximately 2.8 mbgl. Surface samples collected from the drainage channel (SS01 to SS04) consisted of accumulated sediments (sands and gravels) within the drainage channel. The channel was dry at the time of sampling. Sampling at R2 was completed at the v-notch weir after water has flowed through the concrete sump. Since 2023 CS Energy have recovered water from R2 via a vacuum excavator truck to minimise releases from R2.	and 0.0311 µg/L) reported below the Drinking Water Criteria of 0.07 µg/L. Both samples reported raised LORs for a number of compounds, with detections of PFPeS and PFHxS during both events, and PFHpS during the June 2023 event • Sampling of water at release point R2 by CS Energy reported concentrations of PFAS above the laboratory's LOR in all samples, with all samples reporting concentrations of PFOS (0.0115 to 0.0517 µg/L) above the 99% Species Protection limit of 0.00023 µg/L. Samples also generally reported detection of PFBA, PFPeS, PFHxS, PFHpS, PFBA, PFPeA and PFHxA, and were comparable to previous monitoring results from 2021 and 2022.

7.3 Callide A Results Discussion

Additional investigation completed at Callide A did not confirm a specific source area that may be contributing to PFAS impacts reported in the NSP, and release point R2. Review of PFAS results for all samples collected at Callide A indicate concentrations and composition of PFAS at key monitoring locations and across the sample media varies, with no clear correlation between soil investigation results, water samples from the Northern and Eastern Stormwater Ponds and surface water collected from release point R2 (refer **Figure 7**). Variability in PFAS concentrations (refer **Figure 6**) and composition (refer **Figure 7**) was also reported at R2 and the NSP across monitoring events completed between 2021 and 2023.

Previous investigations reported concentrations of PFOS in sediment above the ecological indirect criteria of 0.01 mg/kg at CA15 located within the NSP, with additional investigation locations CA17 to CA19 reporting concentrations generally below the laboratory's LOR and supporting that impacts at CA15 are likely to be localised to the approximately 1.0 m layer of coal ash/dust at this location.

Results from soil investigations support the previous conclusions that Callide A is unlikely to comprise a primary source area, noting that the majority of samples reported concentrations of PFAS below the laboratory's LOR and/or adopted assessment criteria. The differences in PFAS composition at some locations (i.e. soil samples CA04-1.0, CA10-0.0, CA-SS01, CA-SS02 and CA-SS04) may indicate a small number of localised residual PFAS impacts, which may contribute to the variability observed in the NSP and release location R2, combined with localised soil impacts reported within the NSP at borehole CA15. It is noted that the Callide A Power Station was retrofitted to trial low emission coal-fired power generation between 2010 and 2015 (following original decommissioning in 1988), with variability in PFAS concentrations at some locations potentially associated with activities completed during this time.

Comparison of PFAS results for surface water at the NSP (SW44), seepage at R2 and groundwater at MW97 indicate that a potential linkage may exist between surface water and seepage, and surface water/seepage and groundwater, with some similarities between PFAS composition at each location (refer **Figure 7**), however it is noted that no PCA compounds were detected in groundwater at MW97 and a number of PCA compounds reported in the NSP (SW44) were not detected in seepage at R2.

Review of water chemistry between the NSP (SW44), seepage at R2 and groundwater at MW97 (refer piper diagram in **Figure 8**) indicates a potential linkage between seepage at R2 and groundwater at MW97, however surface water at the NSP (SW44) is reported to be distinctly different, which may support that a possible preferential flow path through Ash Dam 2 exists.

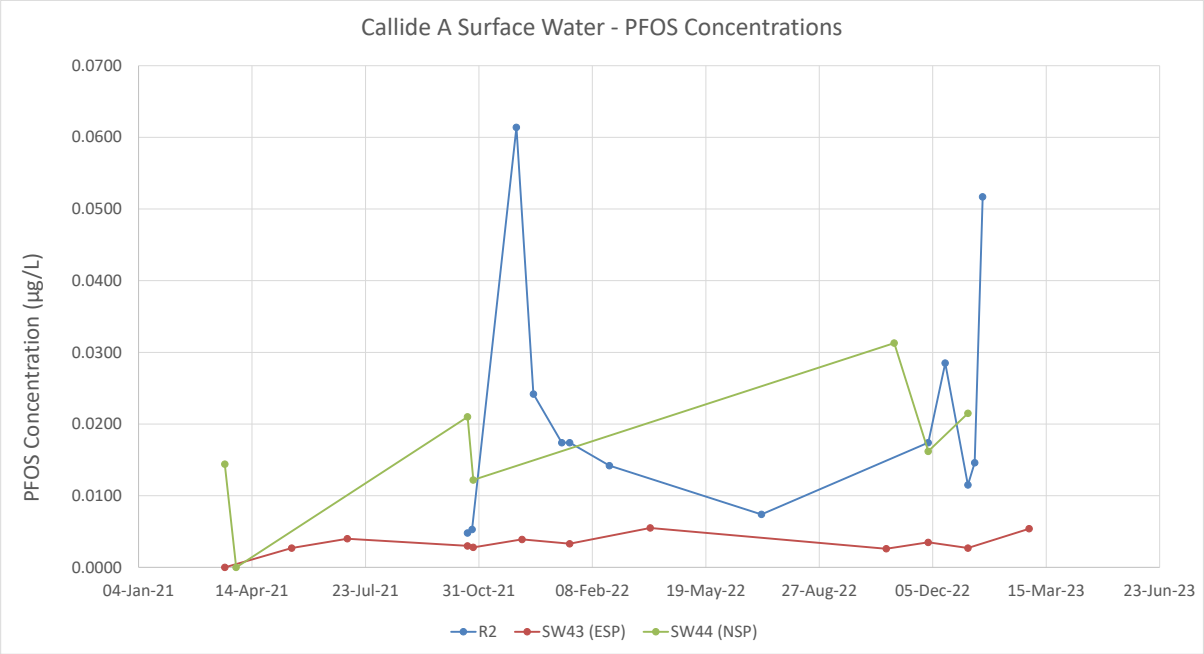


Figure 6. Callide A Surface Water – PFOS Concentrations

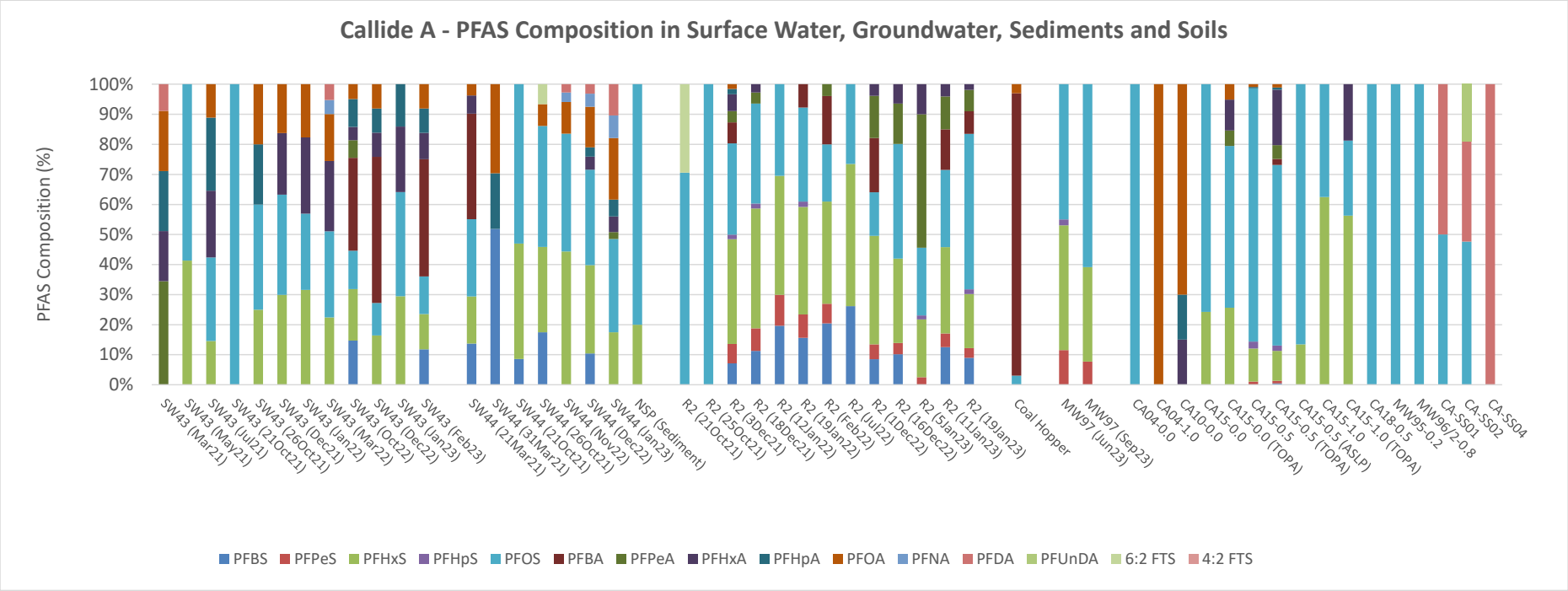


Figure 7. Callide A – PFAS Composition in Surface Water (SW43, SW44, R2, Coal Hopper), Groundwater (MW97), Sediments (NSP) and Soils (CA04, CA10, CA15, CA18, CA-SS01 to SS04)

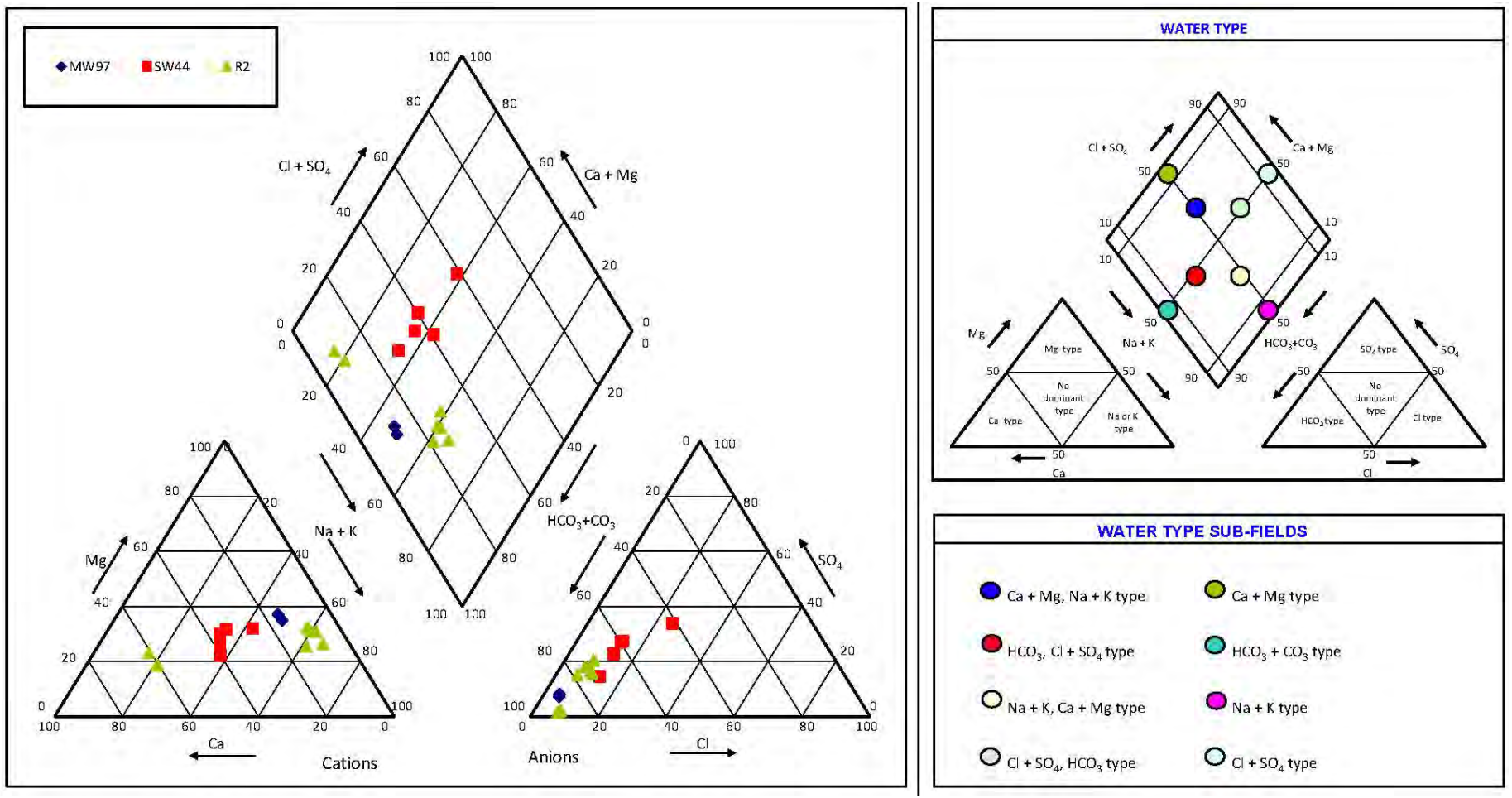


Figure 8. **Callide A – Piper Diagram for Surface Water (SW44, R2) and Groundwater (MW97)**

8 EASTERN SEEPAGE AREAS (DATA GAP 4)

Previous investigation completed in the Eastern Seepage Areas reported significant differences in both concentration and composition between onsite wells (MW11, ESC1, ESC3, ESC4, total PFAS up to 0.859 µg/L) and offsite wells (MW31, MW32, MW33 and MW43, total PFAS up to 9.850 ug/L). As reported in the Initial CLID (Epic, 2022c), it is considered likely that the eastern seepage area comprises at least two seepage pathways, one associated with the current seepage pathway/seepage recovery system, and an additional longer pathway associated with fractured rock which includes monitoring well MW32.

Additional groundwater investigation was undertaken in the Eastern Seepage Area in accordance with the addendum SAQP (Epic 2023a, **Appendix L**) to confirm the nature and extent of seepage pathways at the eastern seepage area.

A summary of the identified data gap and background information associated with the Eastern Seepage Area investigation is presented in **Table 21**.

Table 21. Eastern Seepage Areas (Data Gap 4) Summary

Information sourced from Addendum SAQP (Epic, 2023a) and CLID (Epic, 2022c)

Aspect	Details
Initial CLID Data Gap (Epic, 2022c)	Groundwater results indicate that the eastern seepage area likely comprises at least two seepage pathways, one associated with the current seepage pathway and seepage recovery system, and an additional longer pathway associated with fractured rock which includes monitoring well MW32. Further investigation will be required to confirm the nature and extent of seepage pathways at the eastern seepage area.
Initial CLID Recommendation (Epic, 2022c)	Further investigation of existing seepage pathways (eastern, southern and western) should be undertaken to confirm the extent of current seepage pathways, identify any additional pathways and confirm linkages with the receiving environment. In particular, further investigation is required to determine the nature and extent of the secondary seepage pathway identified at the eastern seepage area, as represented by MW32. Results of the investigation should be used to inform refinement of the existing seepage recovery systems and/or implementation of additional measures to minimise or prevent seepage releases from the site. It is noted that at the time of reporting, CS Energy had engaged a geophysicist to undertake a dipole-dipole resistivity survey of the current seepage areas and surrounding areas to map known and potentially unknown seepage pathways from the Callide B and C sites.
Background and History	Shallow seepage has been reported along the southern boundary of Ash Dam B, with seepage intercepted by the eastern seepage collection trench, with a network of seepage recovery bores (ESC5, ESC6, MW52 and MW61) installed to intercept deeper seepage and return it to Ash Dam B. Highest rates of seepage are observed in the eastern seepage recovery area, with approximately 77% of total seepage recovered during 2020 reported to be from the eastern seepage recovery area (EMS 2022). Current seepage recovery data indicates that >70% of seepage from Ash Dam B is recovered and returned to Ash Dam B via the current seepage recovery schemes (Epic, 2022c). A longer groundwater seepage pathway has also been identified southeast of the eastern seepage recovery area, with the inferred pathway connecting the area of ADB spillway with monitoring wells MW32 and MW43 and ultimately Callide Creek. PFAS travel times from MW32 to MW43, and MW43 to Callide Creek along the inferred seepage flowline as unattenuated solutes are estimated at 4.5 and 6.3 years respectively.
Previous Investigation	Groundwater results for the eastern seepage area report significant differences in PFAS composition between onsite wells (MW11, ESC1, ESC3, ESC4) and offsite wells (MW31, MW32, MW33 and MW43) as shown by **Figure 9** and **Figure 10**. Onsite wells reported total PFAS concentrations up to 0.8590 µg/L (ESC4), with PFAS generally composed of Perfluoroalkyl Sulfonic Acid (PSA) compounds. Offsite wells reporting concentrations up to 9.8500 µg/L (MW32), with PFAS composed of PSAs, PCSAs and FTS compounds. Highest concentrations were reported offsite in MW32, with concentrations observed to decrease to the east (MW33), south (MW31) and southwest (MW43). Concentrations of PFAS within MW32

have remained stable across all monitoring events (Figure 12). MW32 and MW31 are reported to be installed in proximity to an inferred geological fault line (refer **Figure F6**).

Groundwater bore ESC3 is located centrally within the seepage recovery area, with current recovery wells comprising ESC5, ESC6, MW52 and MW61. Composition of PFAS has shown some variance within ESC3 over time (Figure 11), with concentrations reporting a generally increasing trend. Groundwater bore ESC4 is located adjacent to MW52 and likely represents the north-eastern extent of the seepage capture area while MW43 likely represented the south-eastern extent. ESC4 shows a similar PFAS composition to MW32 during the April 2022 monitoring event, with MW43 showing a similar PFAS composition to MW32 during all monitoring events, indicating that some impacted groundwater (as represented by MW32) may be being recovered by the current seepage recovery system. It is likely that the eastern seepage area comprises at least two seepage pathways, one associated with the previously identified pathway and seepage recovery system, and an additional longer pathway possible associated with fractures potentially influencing MW32.

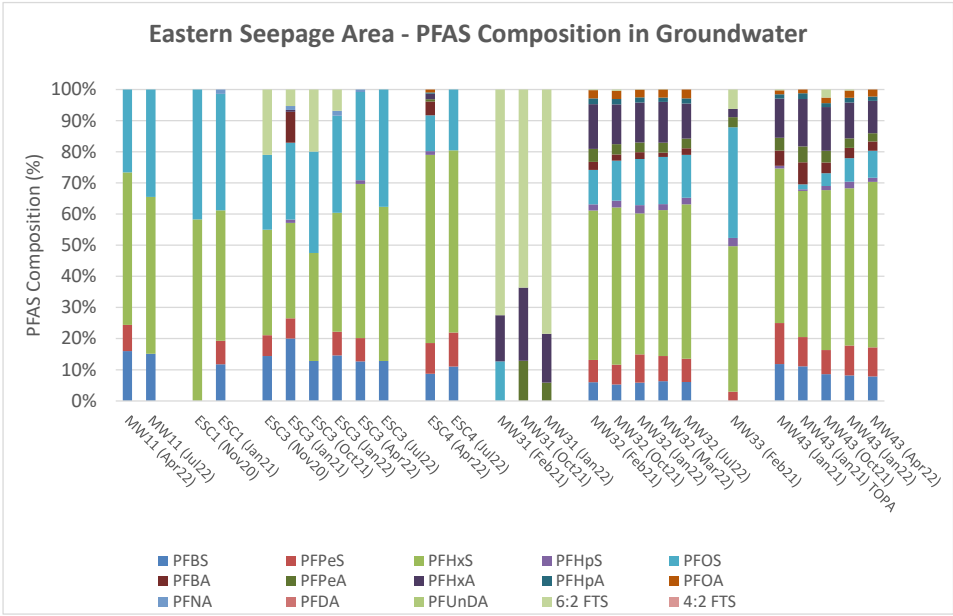


Figure 9. Eastern Seepage Area – PFAS Composition in Groundwater (Epic, 2022c)

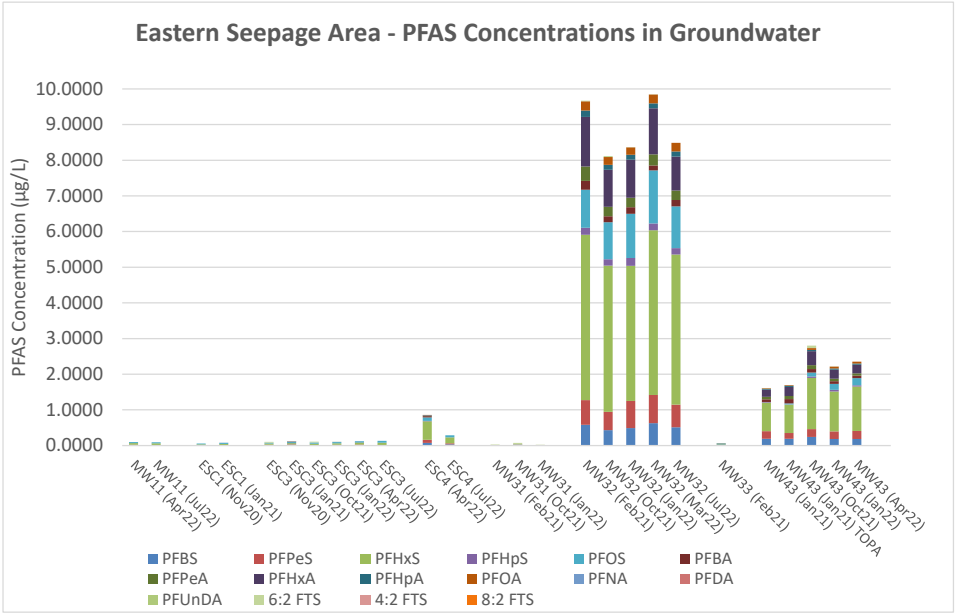


Figure 10. Eastern Seepage Area – PFAS Concentrations in Groundwater (Epic, 2022c)

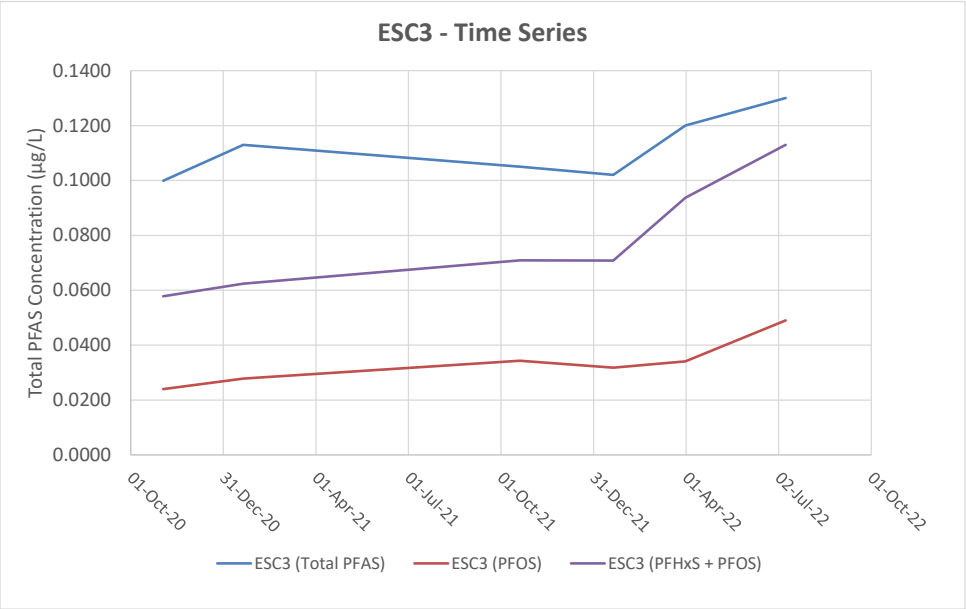


Figure 11. ESC3 Time Series Plot (Epic, 2022c)

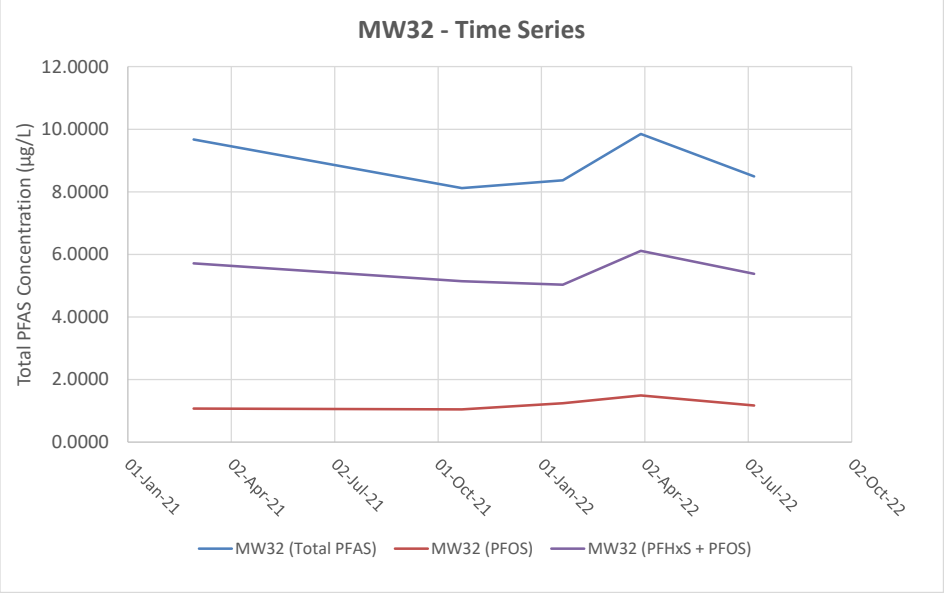


Figure 12. MW32 Time Series Plot (Epic, 2022c)

Geophysical Resistivity Survey	A geophysical resistivity survey has been completed by Fender Geophysics of current seepage areas and surrounding areas to map known and potentially unknown seepage pathways from the Callide B and C sites. The survey was completed using dipole-dipole electrical resistivity imaging (ERI) between 8 and 20 August 2022. The survey identified areas of moisture and potential groundwater at depth within, and surrounding the eastern seepage area, with the report recommending intrusive works to further assess potential seepage areas (where existing monitoring wells are not already established). A copy of the geophysical resistivity survey report is included as **Appendix N**. Based on the findings of the geophysical survey, and in consultation with CS Energy's consultant hydrogeologist, a total of 13 groundwater bores were proposed to be established to further investigate the eastern seepage area and supplement the ongoing groundwater monitoring program.

Groundwater Bore Installation	Of the 13 groundwater bores proposed to be established in the eastern seepage area, nine were completed (MW81 to MW85, MW89 to MW91 and MW94). Groundwater bores MW81, MW82, MW83, MW85 and MW90 were established as 150 mm diameter recovery bores, with the remaining locations comprising 50 mm monitoring wells. Further details on the groundwater bore installation is presented in **Section 13.1**, with a copy of the groundwater bore installation reports included in **Appendix O**.

8.1 Eastern Seepage Areas Investigation Scope

Ongoing groundwater monitoring was completed within the Eastern Seepage Area in accordance with the Addendum SAQP (Epic, 2023a) (**Appendix L**) and the methodology outlined in **Section 5** to provide ongoing assessment of PFAS within key migration pathways. Ongoing monitoring was completed on a quarterly basis with sampling events taking place on 27 Feb – 8 Mar 2023, 6 – 15 Jun 2023, 4 – 9 Sep 2023 and 4 – 14 Dec 2023. Details on the sampling locations are provided in **Table 22.**

Table 22. Eastern Seepage Areas Additional Investigation Scope

Investigation Area/Target	Identified Risk/Target	Sample Details
Eastern Seepage	Potential migration of impacts from Ash Dam B via seepage to the eastern seepage collection area and offsite.	• Quarterly monitoring of MW32, MW42 and MW43 • Seasonal (6-monthly) monitoring of ESC3, ESC4, MW31 and MW33

8.1.1 Deviations from the Addendum SAQP

Monitoring was not completed in accordance with the Addendum SAQP as follows:

- MW33 was not sampled during the Q2 dry season event (June 2023) – incorrectly omitted from Q2 scope
- MW42 was not sampled during the Q1 event (March 2023) – incorrectly omitted from Q1 scope

Following installation and development of additional monitoring and recovery bores (MW81 to MW85, MW89 to MW91 and MW94), bores were included in the Q3 (September) and Q4 wet season (December 2023) quarterly monitoring events.

8.1.2 Field QA/QC

Duplicate sample pairs were collected and analysed at a rate of 1 in every 10 primary samples as part of the wider groundwater and surface water investigation scope in accordance with the PFAS NEMP (refer **Section 4**). Further discussion of field duplicates is presented in **Appendix F**.

8.2 Groundwater Analytical Results

Groundwater analytical results are presented in **Table T1**, **Table T2** and **Table T3**, with a summary provided in **Table 23**.

Table 23. Eastern Seepage Area Investigation Results Summary

Investigation Scope	Monitoring Wells	Identified Risk/Target	Analytical Results
Initial EE Groundwater Investigation (2022)	ESC3 ESC4† MW11† MW13† MW30† MW31 MW32 MW43	Potential migration of impacts from Ash Dam B via seepage to the eastern seepage collection area and offsite.	**Onsite Monitoring Wells (ESC1, ESC3, ESC4 and MW11)** • Results for onsite monitoring wells within the eastern seepage area including ESC1 (Nov20 – Jan21), ESC3 (Nov20 – Jul22), ESC4 and MW11 (Apr-Jun22) reported PFOS exceeding the 99% species protection level during all monitoring events, with concentrations of Sum of PFOS and PFHxS exceeding the drinking water criteria in all monitoring events completed after October 2021 (prior to this, concentrations were reported between 0.0551 µg/L and 0.0624 µg/L). • All wells reported detections of PFBS, PFPeS, PFHxS and PFOS, with PFHpS reported in ESC1, ESC3 and ESC4, PFBA and PFHxA reported in ESC1 and ESC4, PFPeA and PFHpA reported in ESC4 and PFNA and 6:2 FTS reported in ESC1 and ESC3. • Total PFAS concentrations were reported between 0.0511 µg/L (ESC1, Nov20) and 0.859 µg/L (ESC4, Apr22). • TOPA analysis was completed on ESC1 and ESC3 in November 2020 which indicated increases in PFAS concentrations following oxidation, however subsequent analysis in January 2021 reported TOPA and standard analytical results to be comparable (**Table T8**), and the presence of additional PFAS precursors is unlikely. • Analysis for TOF was completed on ESC1 and ESC3 in November 2020 and January 2021. Results were reported at (ESC1, Jan21) or below the laboratory's LOR, indicating samples are unlikely to have a high percentage of other fluorinated organic compounds present. **Offsite Monitoring Wells (MW31, MW32, MW33 and MW43)** • Results for offsite monitoring wells adjacent to the eastern seepage area reported PFOS exceeding the 99% species protection level during at least one monitoring event, with MW32 exceeding the 99% and 95% species protection levels during all monitoring events. MW43 reported concentrations of Sum of PFOS and PFHxS exceeding the drinking water criteria during all monitoring events (up to 1.56 µg/L), with MW32 reporting concentrations exceeding the recreational criteria during all monitoring events (up to 6.11 µg/L). • MW32 and MW43 reported detections of PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFBA, PFPeA, PFHxA, PFHpA, PFOA and 6:2 FTS with total PFAS concentrations up to a maximum of 9.85 µg/L (MW32, Mar22) and 2.80 µg/L (MW43, Oct21). MW31 reporting detections of PFOS, PFPeA, PFHxA and 6:2 FTS, with a total PFAS concentration up to a maximum of 0.0723 µg/L (Oct21). MW33 reporting detections of PFPeS, PFHxS, PFHpS, PFOS, PFPeA, PFHxA and 6:2 FTS with a total PFAS concentration of 0.0642 µg/L (Feb21).

Investigation Scope	Monitoring Wells	Identified Risk/Target	Analytical Results
			• TOPA analysis was completed on MW43 in January 2021 which reported TOPA and standard analytical results to be comparable (**Table T8**), and the presence of additional PFAS precursors is unlikely. • Analysis for TOF was completed on MW43 in January 2021 with results reported below the laboratory's LOR, indicating samples are unlikely to have a high percentage of other fluorinated organic compounds present.
Addendum EE Groundwater Investigation (2023)	ESC3 ESC4 MW31 MW32 MW33 MW42 MW43 MW81 MW82 MW83 MW84 MW85 MW89 MW90 MW91 MW94		• Concentrations of PFOS were reported in all monitoring wells above the 99% Species Protection limit of 0.00023 µg/L for sampling completed during October 2022, March 2023, June 2023, September 2023 and December 2023, with the exception of MW31 in December 2023 (<0.0006 µg/L). Concentrations were reported above the 95% Species Protection limit in MW32 (all samples) and MW43 (October 2022 and March 2023) • Concentrations of the sum of PFOS and PFHxS were reported above the Drinking Water Criteria of 0.07 µg/L in ESC4, MW32 and MW43 (all samples), MW42 (September 2023 and December 2023) and ESC3 (October 2022 and December 2023), with samples from MW32 also reporting concentrations above the Recreational Water criteria of 2.0 µg/L • Highest concentrations were reported in MW32, with total PFAS (10.5 µg/L, December 2023) reported above the historical maximum of 9.85 µg/L (March 2022) • All of the nine new monitoring/recovery bores reported concentrations of PFOS above the 99% Species Protection limit, with concentrations also reported above the 95% Species protection limit in MW84 (all samples), MW85 (September 2023 and December 2023), MW89 (December 2023) and MW91 (September 2023) • With the exception of MW82, all new monitoring/recovery bores reported concentrations of the sum of PFOS and PFHxS above the Drinking Water Criteria, with MW84 (all samples) reporting concentrations above the Recreational Water Criteria • MW84, located onsite and adjacent to the ADB spillway reported the highest concentrations of PFAS, with PFOS, sum of PFOS and PFHxS and total PFAS reported at 12.0 µg/L, 33.5 µg/L and 48.6 µg/L respectively during the September 2023 monitoring event, and representing the highest concentrations of PFAS reported in groundwater at any of the monitoring locations in the program (next highest concentrations reported in MW32)

Notes: [†] Monitoring wells only included in April and July 2022 monitoring events in accordance with the SAQP (Epic 2022a)

8.3 Eastern Seepage Area Results Discussion

Groundwater results for the eastern seepage area support the presence of two seepage pathways, one associated with the current seepage pathway and seepage recovery system (ESC3, ESC4, ESC5, ESC6, MW42, MW52, MW61, MW83 and MW85), and an additional longer pathway associated with fractured rock roughly following a flow path connecting MW84, MW32 and MW43.

Existing monitoring wells reported PFAS concentrations to generally be stable and comparable to historical results. With the exception of MW84, all new groundwater bores reported results that are generally comparable to nearby wells and assist in further understanding the potential extent of known seepage pathways, noting that a number of the monitoring wells are located within the zone of influence of the current seepage recovery network (refer **Section 14.1.1** and approximate seepage recovery zone shown on **Figure F6**).

Groundwater monitoring wells MW84, MW32, MW43 along the main inferred seepage pathway (and MW89 and MW91 adjacent to the main pathway) show similar PFAS signatures (**Figure 13**) with decreasing concentrations from north (MW84) to south (MW43) and east to west. Low concentrations of PFAS are reported in MW33 and MW31 located further east, which is supported by the existing understanding of known seepage influences and seepage from Callide Dam (EMS, 2024), with locations beyond the influence of historical seepage from ADB. This is shown in **Figure 14**. The similarities in PFAS composition, along with elevated concentrations along the MW84 to MW43 alignment, supported the presence of a second seepage pathway.

Some fluctuation is observed in concentrations within groundwater monitoring wells MW89 and MW91 across the three monitoring events, which may be associated with their proximity to the centre of the longer seepage pathway (likely to be located to the west and east of the interpolated centre line respectively), and/or influence from the existing seepage recovery capture zone to the west (refer **Figure F6**).

Although PFAS concentrations in MW84 (total PFAS 36.7 – 48.6 µg/L) are significantly higher than results reported as part of the EE CLID (Epic, 2022c) (MW32 total PFAS 8.12 – 10.50 µg/L), it's not considered to change the current understanding of potential risk associated with the eastern seepage area, with results from existing hydraulically downgradient monitoring wells MW32 and MW43 remaining stable over time. Results report concentrations of PFAS reducing between MW84 and MW32, and then further reducing between MW32 and MW43, as shown in **Figure 14**. Reduction in concentration is likely to continue between MW43 and the discharge point to Callide Creek, noting that in general, concentrations of surface water in Callide Creek (as represented by SW12) are at or below the Drinking Water Criteria.

The nearest known PFAS source area to MW84 (with high PFAS concentrations) is the FOT, located approximately 900 m north. It's noted that MW84 and MW32 are located in close proximity to the location of the inferred geological fault line, which is inferred to continue north towards the FOT. It is noted that perfluoroalkyl sulfonic acid (PSA) compounds comprised the main functional group (~70-80%) in MW84, MW32 and MW43, with PFHxS (~40-50%) the main compound by percent composition. Comparison with soil results from the FOT (refer Figure 45 in the EE CLID (Epic, 2022c)) report a similar proportion of PSA compounds (>70%), however PFOS is generally reported to be the main compound (~70-90%).

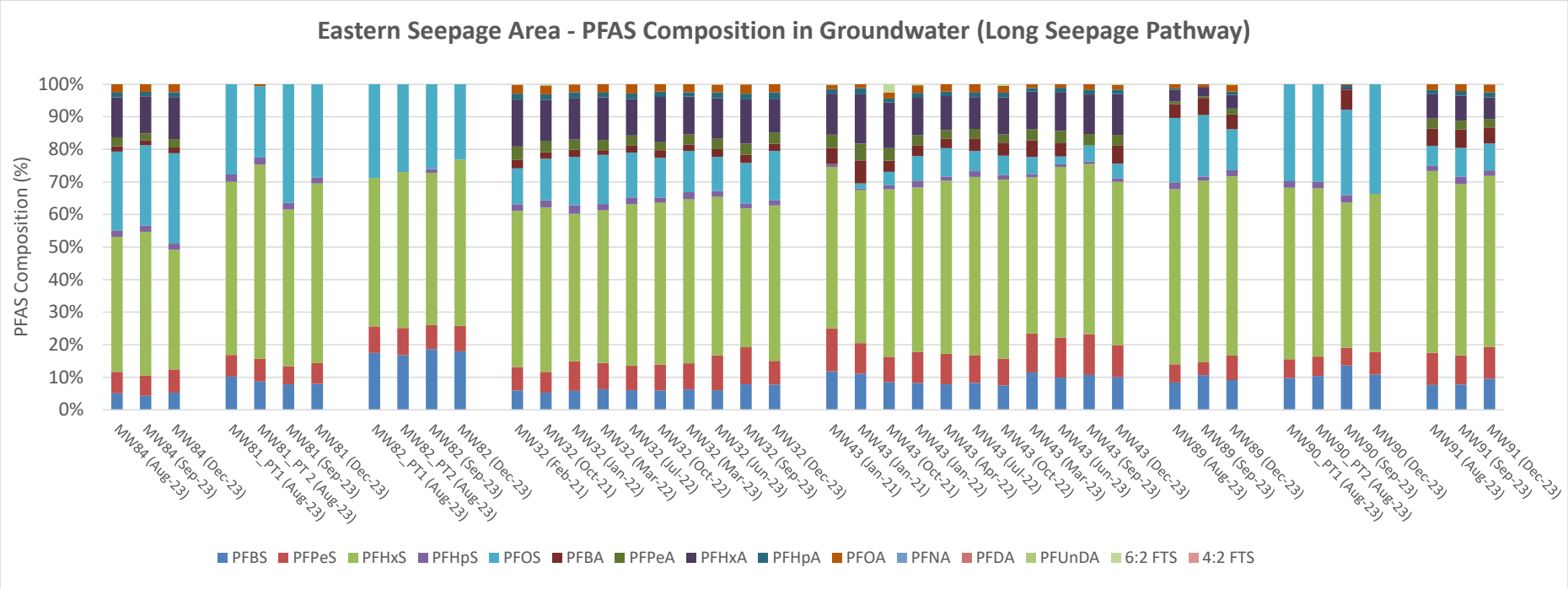


Figure 13. Eastern Seepage Area – PFAS Composition in Groundwater (Long Seepage Pathway)

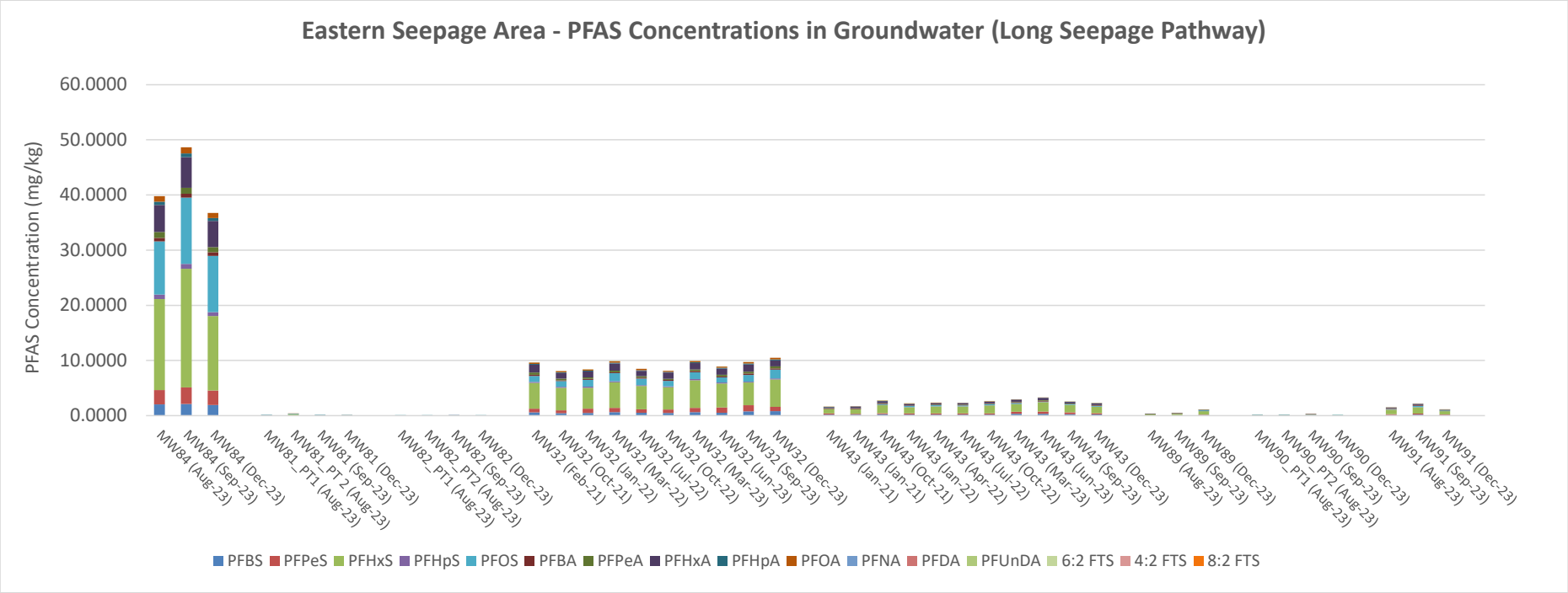


Figure 14. Eastern Seepage Area – PFAS Concentration (Long Seepage Pathway)

9 WESTERN SEEPAGE AREA (DATA GAP 5)

Previous investigations completed in the Western Seepage Areas reported PFAS composition to be comparable across all monitoring wells, with MW49 reporting a greater proportion of PFHxS and highest concentrations (total PFAS up to 4.67 µg/L, approximately one order of magnitude higher than other wells [total PFAS between 0.22 – 1.01 ug/L]). It is considered likely that surface water within the Western Stormwater Diversion Channel infiltrates through shallow alluvial soils in the southern portion of the site, however previous investigation results indicate this is unlikely to be the cause of elevated concentrations within MW49 which may be located outside of the current groundwater seepage capture area.

Additional groundwater investigation was undertaken at the Western Seepage Area in accordance with the addendum SAQP (Epic 2023a, **Appendix L**) to confirm the nature and extent of seepage pathways at the western seepage area.

A summary of the identified data gap and background information associated with the Western Seepage Area investigation is presented in **Table 24**.

Table 24. Western Seepage Area (Data Gap 5) Summary

Information sourced from Addendum SAQP (Epic, 2023a) and CLID (Epic, 2022c)

Aspect	Details
Initial CLID Data Gap (Epic, 2022c)	Groundwater results from the western seepage area indicate some wells, including MW49, may be outside the current groundwater seepage recovery area. In addition, surface water within the Western Stormwater Diversion Channel (carrying stormwater from the north) may infiltrate through alluvial soils in the south-western portion of the site, potentially contributing to PFAS impacts in groundwater. Further investigation will be required to confirm the nature and extent of seepage pathways at the western seepage area along with potential contribution from surface water infiltration.
Initial CLID Recommendation (Epic, 2022c)	Further investigation of existing seepage pathways (eastern, southern and western) should be undertaken to confirm the extent of current seepage pathways, identify any additional pathways and confirm linkages with the receiving environment. It is noted that at the time of reporting, CS Energy had engaged a geophysicist to undertake a geophysical survey of the current seepage areas and surrounding areas to map known and potentially unknown seepage pathways from the Callide B and C sites.
Background and History	Shallow seepage has been reported along the western and southern boundaries of Ash Dam B, with seepage intercepted by the western seepage collection trench, with a network of seepage recovery bores (MW55 to MW58) installed to intercept deeper seepage and return it to Ash Dam B.
Previous Investigation	Groundwater results from the western seepage area reported PFAS composition to be comparable across all monitoring wells **(Figure 15**), with MW49 reporting a greater proportion of PFHxS (green). MW49 also reported highest PFAS concentrations (**Figure 16**), with remaining locations reporting concentrations approximately one order of magnitude lower. Groundwater monitoring well MW49 is located adjacent to where the Western Stormwater Diversion Channel exits the site. This portion of the site is underlain by the alluvial soils associated with a former creek channel (refer **Figure F7**). The section of the Western Stormwater Diversion Channel near MW49 can also receive overflow from the Western Seepage Collection Pond should it overflow. MW49 is also likely outside of the current groundwater seepage capture area, with current recovery wells comprising MW55, MW56, MW57 and MW58. Surface water flows along the Western Stormwater Diversion Channel may pool within the former creek channel and infiltrate to alluvial soils, however, a comparison of results for MW49 (total PFAS up 4.34 µg/L) to surface water in the Western Seepage Collection Pond (SW03, total PFAS up to 0.486 µg/L) and the Western Stormwater Diversion Channel (SW35, total PFAS up to 0.443 µg/L) indicate that current surface water flows are unlikely to be the cause of high PFAS concentrations reported in MW49.

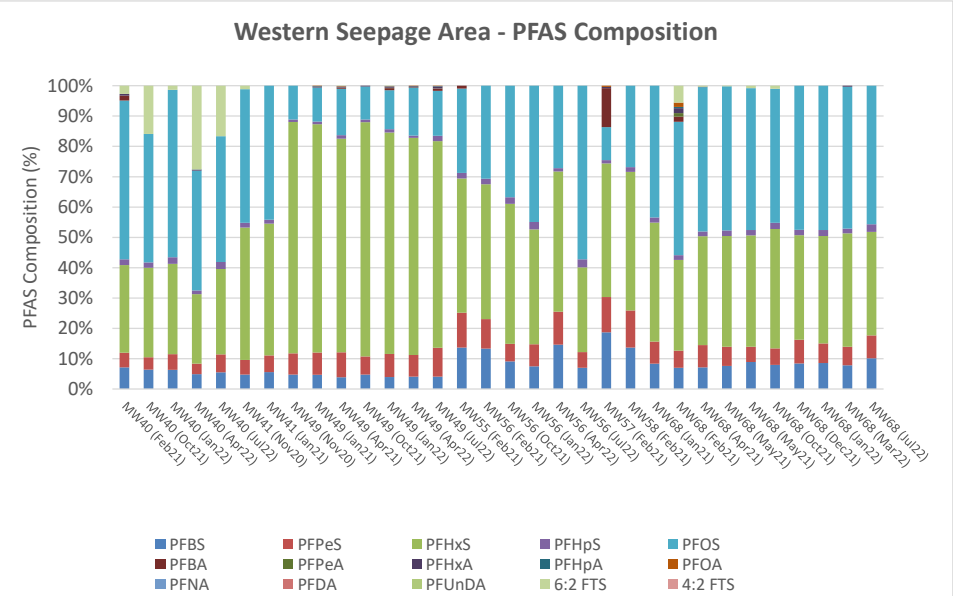


Figure 15. Western Seepage Area – PFAS Composition in Groundwater (Epic, 2022c)

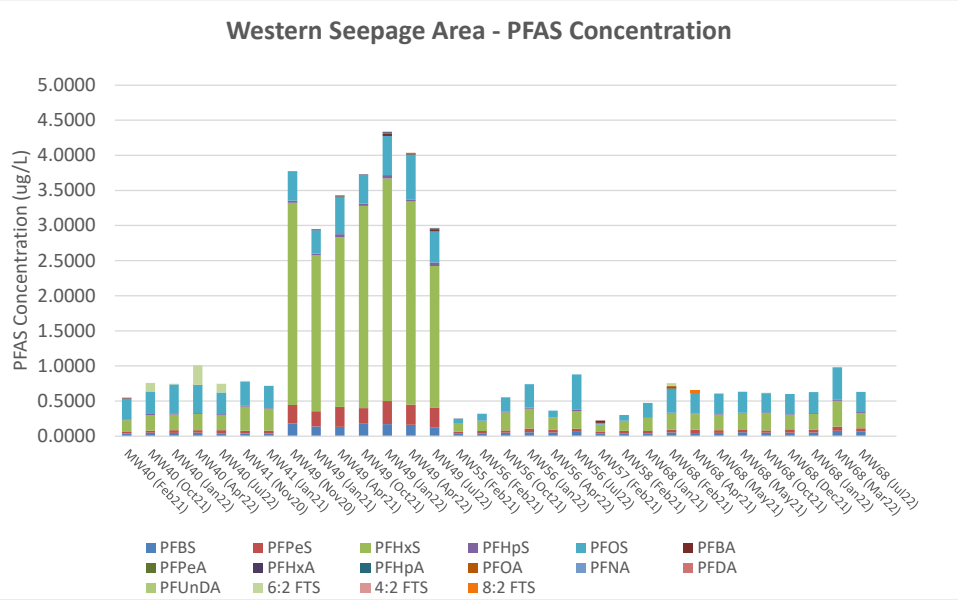


Figure 16. Western Seepage Area – PFAS Concentration in Groundwater (Epic, 2022c)

Geophysical Resistivity Survey	A geophysical resistivity survey has been completed by Fender Geophysics of current seepage areas and surrounding areas to map known and potentially unknown seepage pathways from the Callide B and C sites. The survey was completed using dipole-dipole electrical resistivity imaging (ERI) between 8 and 20 August 2022. The survey identified areas of moisture and potential groundwater at depth within, and surrounding the eastern seepage area, with the report recommending intrusive works to further assess potential seepage areas (where existing monitoring wells are not already established). A copy of the geophysical resistivity survey report is included as **Appendix N**. Based on the findings of the geophysical survey, and in consultation with CS Energy's consultant hydrogeologist, one groundwater bore was proposed to be established east of the current western seepage area to supplement the ongoing groundwater monitoring program.
Groundwater Bore Installation	One groundwater monitoring bore (MW98) was completed east of the western seepage area, with an additional bore (MW86) installed between the western and southern seepage areas, however the bore is reported to be dry. Further details on the groundwater bore installation is

	presented in **Section 13.1**, with a copy of the groundwater bore installation reports included in **Appendix O**.

9.1 Western Seepage Areas Investigation Scope

Ongoing groundwater monitoring was completed within the Western Seepage Area in accordance with the Addendum SAQP (Epic, 2023a) (**Appendix L**) and the methodology outlined in **Section 5** to provide ongoing assessment of PFAS within key migration pathways. Ongoing monitoring was completed on a quarterly basis with sampling events taking place on 27 Feb – 8 Mar 2023, 6 – 15 Jun 2023, 4 – 9 Sep 2023 and 4 – 14 Dec 2023. Details on the sampling locations are provided in **Table 25.**

Table 25. Western Seepage Areas Additional Investigation Scope

Investigation Area/Target	Identified Risk/Target	Sample Details
Western Seepage	Potential migration of impacts from Ash Dam B via seepage to the western seepage collection area and offsite.	• Quarterly monitoring of MW40, MW49, MW56 and MW68

9.1.1 Deviations from the Addendum SAQP

Monitoring was not completed in accordance with the Addendum SAQP as follows:

- MW56 was not sampled during the Q1 (March 2023), Q2 (June 2023) or Q3 (September 2023) events due to the seepage recovery pump not being operational at the time of sampling. It has been reported that this bore has been dry since August 2023.

Following installation and development of additional monitoring bore MW98, sampling was completed during the Q3 (September 2023) and Q4 wet season (December 2023) quarterly monitoring events.

9.1.2 Field QA/QC

Duplicate sample pairs were collected and analysed at a rate of 1 in every 10 primary samples as part of the wider groundwater and surface water investigation scope in accordance with the PFAS NEMP (refer **Section 4**). Further discussion of field duplicates is presented in **Appendix F**.

9.2 Groundwater Analytical Results

Groundwater analytical results are presented in **Table T1**, **Table T2** and **Table T3**, with a summary provided in **Table 26**.

Table 26. Western Seepage Area Investigation Results Summary

Investigation Scope	Monitoring Wells	Identified Risk/Target	Analytical Results
Initial EE Groundwater Investigation (2022)	MW40 MW41 MW49 MW55 MW56 MW57 MW58 MW68 MW98	Potential migration of impacts from Ash Dam B via seepage to the western seepage collection area and offsite.	**Groundwater Analytical Results** • All samples reported concentrations of PFBS, PFPeS, PFHxS, PFHpS and PFOS above the laboratory's LOR, with PFOS reported above the 99% species protection level in all samples. Concentrations of PFOS were also reported above the 95% species protection level in MW40, MW41, MW49 and MW68 in all monitoring events, and MW56 during three of the five monitoring events. • All samples reported concentrations of Sum of PFOS and PFHxS above the drinking water guideline of 0.07 µg/L, with all samples from MW49 also reported above the recreational guideline limit of 2 µg/L. • MW40, MW41, MW49, MW55, MW57 and MW68 reported detections of PCAs during some monitoring events, including PFBA, PFPeA, PFHxA, PFHpA and PFOA, with MW40, MW41 reporting detections of 6:2 FTS, and MW68 reporting detections of 6:2 FTS and 8:2 FTS. • Highest total PFAS concentrations were reported in MW49 at 4.34 µg/L on 20 January 2022. **TOPA Analytical Results** TOPA analysis was completed on MW41 (Nov20 and Jan21), MW49 (Nov20 and Jan21) and MW68 (Jan21), with percentage increases of total PFAS reported between 14 % (MW41, Jan21) and 47 % (MW41, Nov20) (refer **Table T8**). Based on the results, it is considered that groundwater at the western seepage area may contain an additional mass of PFAS precursors. **TOF Analytical Results** Analysis for TOF was completed on MW41 (Nov20 and Jan21), MW49 (Nov20 and Jan21) and MW68 (Jan21), with concentrations reported below the laboratory's LOR, indicating samples are unlikely to have a high percentage of other fluorinated organic compounds present.
Addendum EE Groundwater Investigation (2023)	MW40 MW49 MW56 MW68 MW98		**Groundwater Analytical Results** • Results for MW40, MW49 and MW68 were comparable to previous investigation results, with concentrations reported within historical ranges • All samples reported concentrations of PFOS above the 99% Species Protection limit, with concentrations reported above the 95% Species Protection limit during at least one sampling event in all wells excluding MW98 • All samples reported concentrations of the sum of PFOS and PFHxS above the Drinking Water Criteria of 0.07 µg/L, with concentrations reported above the Recreational Water Criteria of 2.0 µg/L in MW49 in March, June and September 2023

Investigation Scope	Monitoring Wells	Identified Risk/Target	Analytical Results
			• MW49 reported PFAS concentrations comparable to, and within the historical range in the western seepage area (total PFAS 0.718 to 4.34 µg/L, refer **Figure 17**), with a greater proportion of PFHxS (refer **Figure 18**) and highest concentrations (approximately one order of magnitude higher) than other wells (refer **Figure 19**) • MW98, installed immediately east of MW49, reported the lowest PFAS concentrations within the western seepage area bores (total PFAS 0.106 to 0.163 µg/L), with concentrations of PFOS (0.0400 to 0.0647 µg/L) and the sum of PFOS and PFHxS (0.0991 to 0.150 µg/L) reported above the 99% Species Protection limit and Drinking Water Criteria respectively **TOPA Analytical Results** TOPA analysis was completed on MW98 (Aug23) by GHD, with percentage increase of total PFAS reported at 8% (refer **Table T8**). Results for MW98 support previous investigation results which indicate that groundwater at the western seepage area may contain an additional mass of PFAS precursors. **TOF Analytical Results** Analysis for TOF was completed on MW98 (Aug23) by GHD with concentrations reported below the laboratory's LOR of 20 µg/L, indicating samples are unlikely to have a high percentage of other fluorinated organic compounds present.

9.3 Western Seepage Area Results Discussion

Groundwater results from the western seepage area reported PFAS composition to be comparable across all monitoring wells (**Figure 18**), with MW49 reporting a greater proportion of PFHxS (shown in green). MW49 also reported highest PFAS concentrations (**Figure 19**), with remaining locations reporting concentrations approximately one order of magnitude lower.

Groundwater monitoring well MW49 is located adjacent to where the Western Stormwater Diversion Channel exits the site, with results consistent across monitoring events completed between November 2020 and December 2023. This portion of the site is underlain by the alluvial soils associated with a former creek channel (refer **Figure F7**). The section of the Western Stormwater Diversion Channel near MW49 can also receive overflow from the Western Seepage Collection Pond should it overflow. MW49 is also likely outside of the current groundwater seepage capture area, with current recovery wells comprising MW55, MW56, MW57 and MW58. Surface water flows along the Western Stormwater Diversion Channel may pool within the former creek channel and infiltrate to alluvial soils, however, as discussed in the Initial CLID (Epic, 2022c), current surface water flows are unlikely to be the cause of high PFAS concentrations reported in MW49 based on PFAS concentrations reported in surface water (as represented by SW28, SW35 and SW46). Results for monitoring at MW98, located approximately 14 m east of MW49, indicate that elevated PFAS concentrations are likely to be localised, with concentrations of total PFAS approximately 10% of those reported in MW49. Monitoring well MW86, located approximately 250 m east of MW98, was reported to be dry.

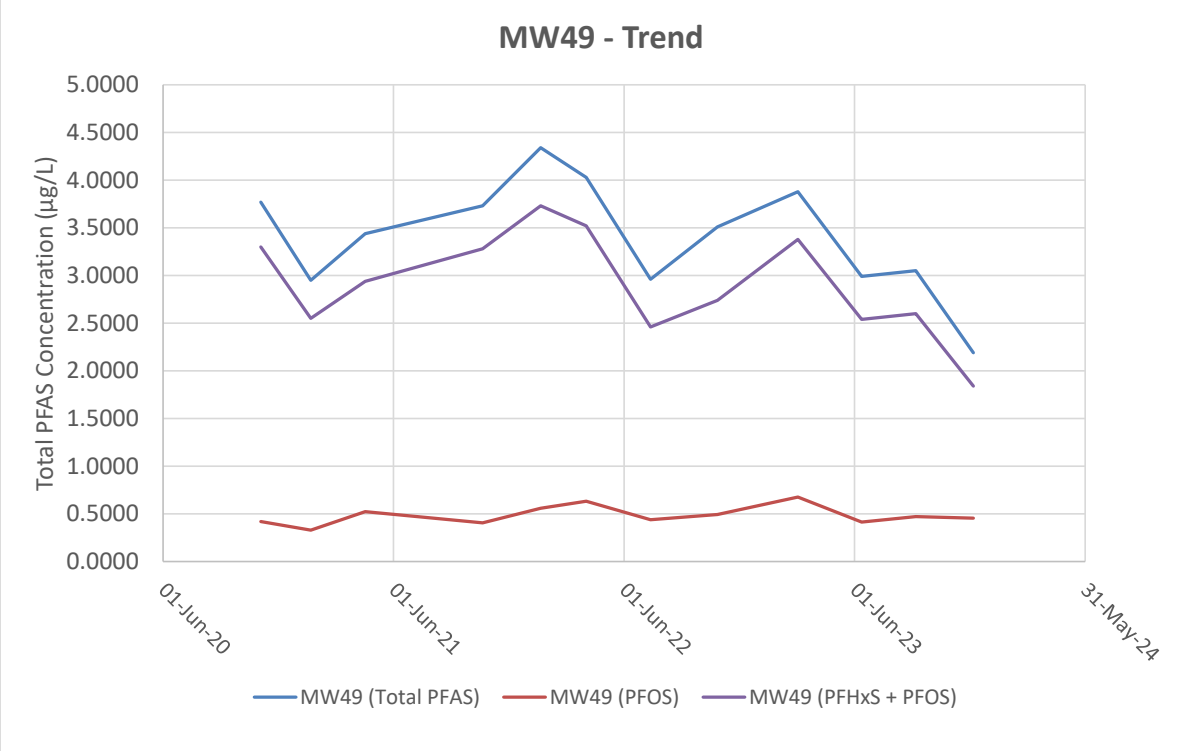


Figure 17. MW49 PFAS Concentration Trend

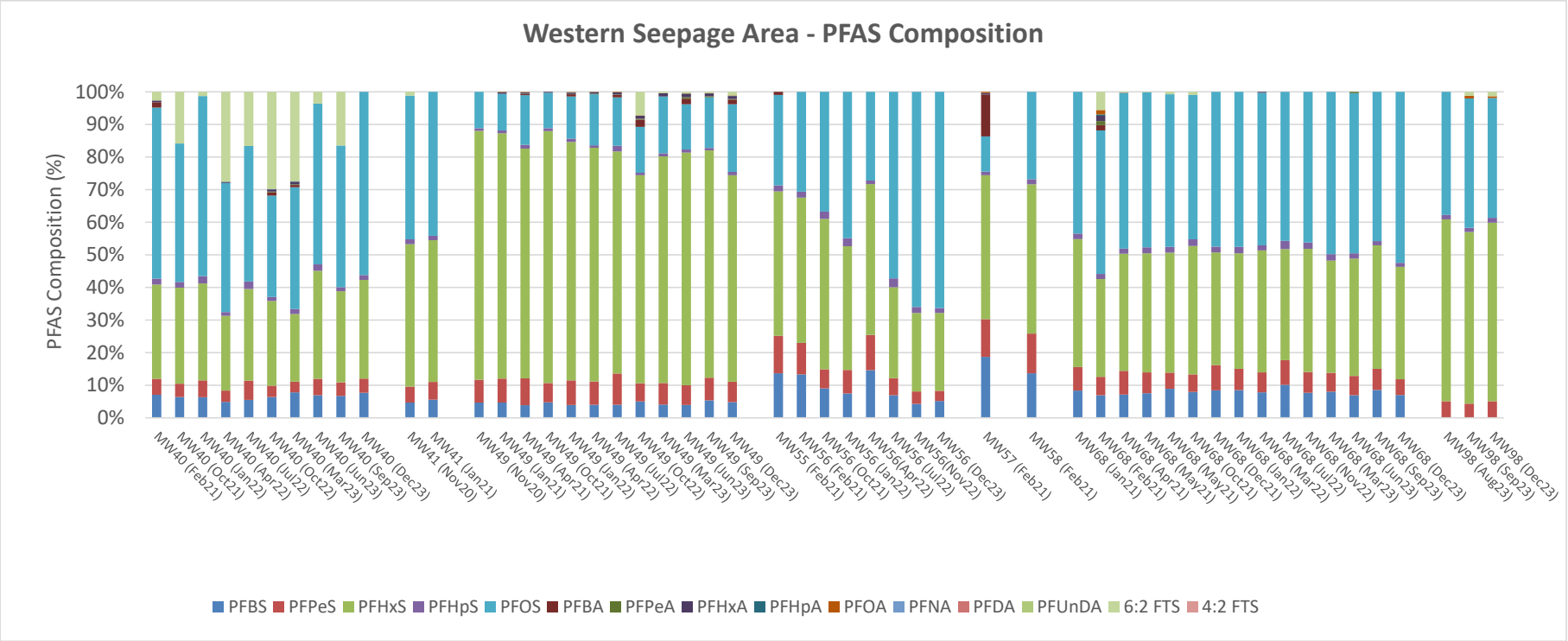


Figure 18. Western Seepage Area PFAS Composition in Groundwater

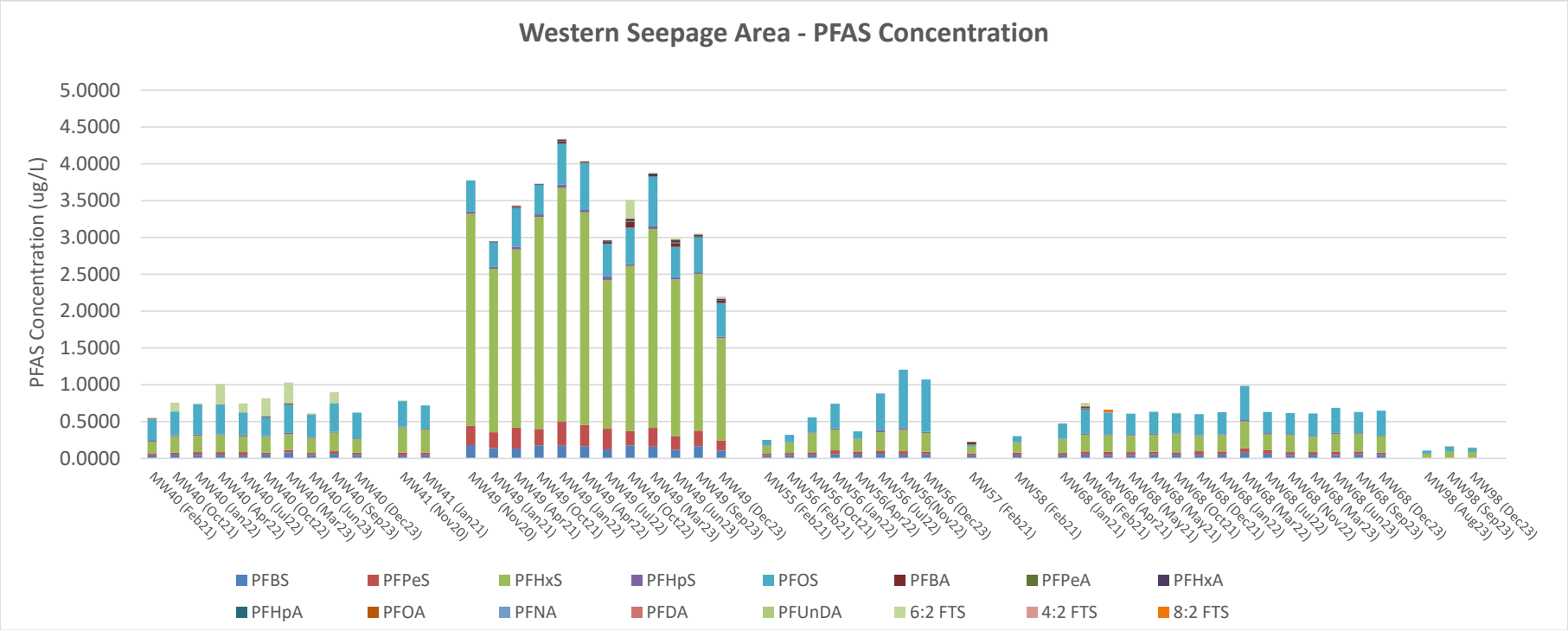


Figure 19. Western Seepage Area PFAS Concentrations in Groundwater

10 NORTHERN BOUNDARY (DATA GAP 6)

Previous investigation along the northern site boundary reported concentrations of PFAS in the three main watercourses entering the site as represented by sample locations SW33, SW34 and BS3-CW. Surface water samples collected from the three stormwater channels (northern watercourse BS3, northern watercourse east and northern water course central) reported concentrations of PFOS above the 99% species protection limit and Sum of PFOS and PFHxS above the drinking water criteria during at least one sampling event.

Additional investigation has been undertaken along the northern site boundary based on the addendum SAQP (Epic 2023a, **Appendix L**) to assess the nature of PFAS entering the site via these pathways.

A summary of the identified data gap and background information associated with the northern site boundary is presented in **Table 27**.

Table 27. Northern Boundary (Data Gap 5) Summary

Information sourced from Addendum SAQP (Epic, 2023a) and CLID (Epic, 2022c)

Aspect	Details
Initial CLID Data Gap (Epic, 2022c)	High concentrations of PFAS have been reported to be entering the northern boundary of the site via surface water, with surface water, groundwater and sediment impacts identified within the northern and western stormwater diversion channels. Further investigation will be required to assess the nature (including mass) of PFAS entering the site via these pathways. It is noted that management of PFAS impacts from these pathways will need to be undertaken in conjunction with remediation and/or management of offsite source areas.
Initial CLID Recommendation (Epic, 2022c)	Management of impacted surface water, groundwater and sediments along the northern site boundary will be required, however it is noted that the source of PFAS impacts is located offsite and owned by a third party. On this basis, any remediation or management of impacts identified at the site will need to be in collaboration with upgradient landowner(s) and DES. Temporary PFAS management options should be investigated (i.e. passive sorption water treatment technologies) to determine their suitability for interim management of PFAS impacted surface water, noting adoption and implementation of any technologies should be undertaken in collaboration with upgradient landowners and DES. Once offsite impacts have been adequately remediated or managed, measures should be implemented to manage any residual impacts (i.e. removal of impacted sediment).
Background and History	Groundwater results for background monitoring wells located along the northern (hydraulically upgradient) boundary indicated that groundwater located along the northern site boundary (as represented by MW01 and MW74) is likely to have been impacted from surface water entering the northern site boundary from the area of the mine (operated by Batchfire), which has reported elevated concentrations of PFAS (including SW34 and SW33).
Previous Investigation	Groundwater results for MW01 and MW74 reported detectible concentrations of PFAS compounds, with MW74 reporting concentrations of PFOS above the 99% species protection limit and Sum of PFOS and PFHxS above the drinking water criteria during the December 2021, April 2022 and July 2022 monitoring events. Both monitoring wells are located along the northern site boundary, north of operational areas and are considered to represent background groundwater quality. Groundwater monitoring well MW01 is located adjacent to the northern drainage channel (west), with surface water sampling location SW37 located upstream at the railway line culvert. Surface water at SW37 has reported detections of PFOS, PFBA, PFPeA, PFHxA and PFHpA with total PFAS reported up to 0.0235 µg/L (May 2021). MW01 has reported detections of PFPeA, PFHxA, PFHpA and 6:2 FTS with total PFAS reported up to 0.0500 µg/L (November 2020). Groundwater monitoring well MW74 is located adjacent to the northern drainage channel (east), with surface water sampling location SW34 located upstream at the railway line culvert. Surface water at SW34 has reported detections of PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, 6:2 FTS and 8:2 FTS with total PFAS reported up to 6.62 µg/L (July 2021). MW74 has reported detections of FBS, PFPeS, PFHxS, PFHpS, PFOS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, MeFOSAA and 6:2 FTS with total PFAS reported up to 0.90 µg/L (April 2022). In general, the PFAS composition of MW74 and SW34 are comparable across all monitoring events (**Figure 20**). PFAS concentrations at SW34 are observed to be variable across the monitoring events (**Figure 21**), with concentrations within MW74 reported to be increasing over time.

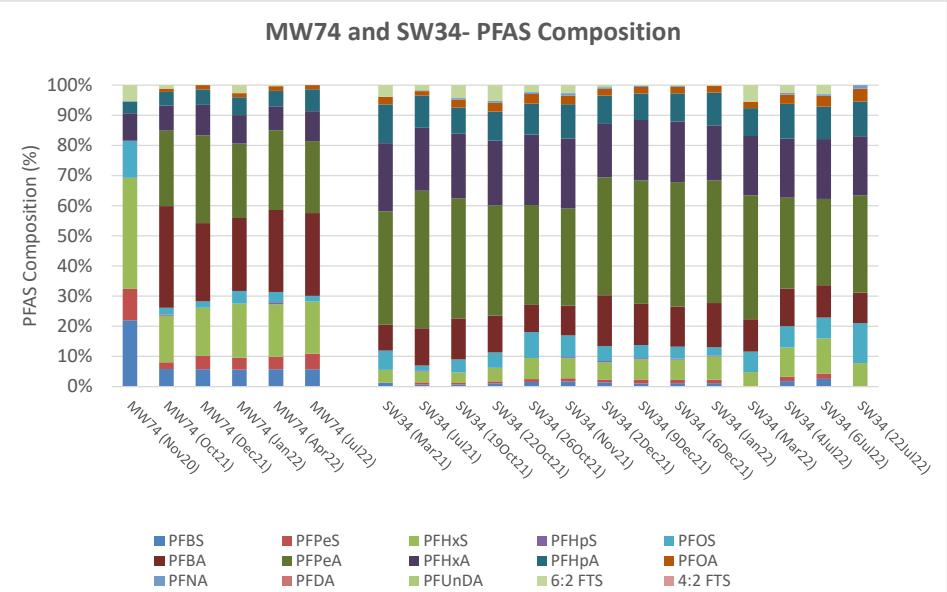


Figure 20. MW74 and SW34 – PFAS Composition in Groundwater (MW74) and Surface Water (SW34)(Epic, 2022c)

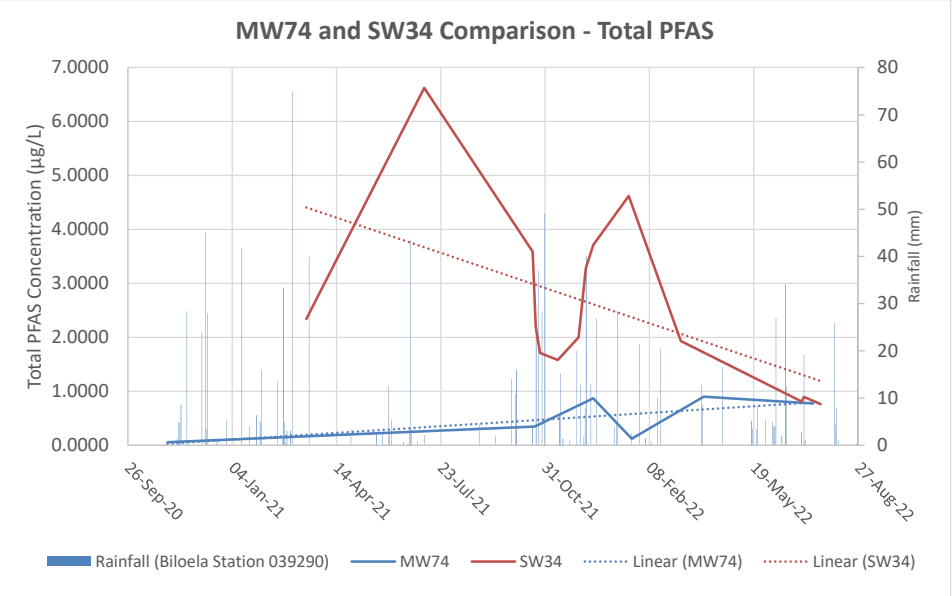


Figure 21. Total PFAS Concentrations – MW74 and SW34 (Epic, 2022c)

Surface water entering the northern (upgradient) site boundary from the area of the mine, has reported elevated concentrations of PFAS (including at location SW34 and SW37, with groundwater monitoring results indicating that groundwater entering the site along the northern site boundary (as represented by MW01 and MW74) is likely to have been impacted from these surface water flows. It is noted that based on the topography of areas north of the site, groundwater impacts may be localised to areas along the northern site boundary where surface water pools following flow events, with features including the railway line providing a constriction to surface water flows which can result in localised pooling of water.

10.1 Northern Boundary Investigation Scope

Ongoing surface water and groundwater monitoring was completed along the northern site boundary in accordance with the Addendum SAQP (Epic, 2023a) (**Appendix L**) and the methodology outlined in **Section 5** to provide ongoing assessment of PFAS within key migration pathways. Ongoing monitoring was completed on a

quarterly basis with sampling of surface water locations completed following rainfall events subject to access restrictions. Three additional surface water monitoring locations (BS3 CW, BS3 CWN and BS3 CWE) were established along the northern site boundary upgradient of BS3 (Ash Dam 3) to monitor inflows from two watercourse lines that feed into the clean water diversion drain installed around BS3. An existing surface water monitoring location (BS3) was included to monitor runoff from rehabilitated surfaces of BS3.

Details on the sampling locations are provided in **Table 25**, with monitoring locations shown on **Figure F8**. Laboratory documentation provided in **Appendix K**.

Table 28. Northern Boundary Additional Investigation Scope

Investigation Area/Target	Identified Risk/Target	Sample Details
Northern Watercourse BS3	Potential impacts from offsite sources to surface water entering the northern site boundary and managed as part of the northern and western stormwater diversion channel. Background monitoring location to assess hydraulically upgradient groundwater entering the site.	• Surface water monitoring locations BS3, BS3 CW, BS3 CWN, BS3 CWE, SW45
Northern Watercourse (East)		• Surface water monitoring locations SW34 • Groundwater monitoring well MW74
Northern Watercourse (Central)		• Surface water monitoring locations SW33 and SW06
BS3 (Ash Dam 3)	Monitoring of surface water runoff from the rehabilitated surface of BS3	• BS3

10.1.1 Deviations from the Addendum SAQP

Quarterly monitoring of surface water monitoring locations was not completed during each nominated event due to insufficient surface water being present to enable sampling. Additional surface water monitoring was completed following rainfall events where locations were able to be safely accessed during flow events. Monitoring was not completed in accordance with the Addendum SAQP as follows:

- Monitoring of SW33 and SW34 was not completed during the quarterly events due to the locations being dry. Sampling was completed by CS Energy's environmental team in December 2022 and January 2023 following rainfall events
- Monitoring of SW45 was only completed during the September and December 2023 monitoring events
- Monitoring of SW06 was not completed as part of the current investigation with the location dry during the quarterly monitoring events and inaccessible during rainfall events
- Monitoring of BS3-CW and BS3-CWN was limited to monitoring by CS Energy's environmental team in December 2022 and January 2023 following rainfall events
- Monitoring of BS3-CWE was not completed as part of the current monitoring event due to access restrictions during rainfall events. It is noted that BS3-CW is located downstream of BS3-CWE

10.1.2 Field QA/QC

Duplicate sample pairs were collected and analysed at a rate of 1 in every 10 primary samples as part of the wider groundwater and surface water investigation scope in accordance with the PFAS NEMP (refer **Section 4**). Further discussion of field duplicates is presented in **Appendix F**.

10.2 Surface Water and Groundwater Analytical Results

Surface water and groundwater analytical results are presented in **Table T1**, **Table T2** and **Table T3**, with a summary provided in **Table 29**.

Table 29. Northern Boundary Investigation Results Summary

Investigation Scope	Monitoring Location	Identified Risk/Target	Analytical Results
Initial CLID Groundwater Investigation (2022)	MW01[†] MW74	Potential impacts from offsite sources. Background monitoring location to assess hydraulically upgradient groundwater entering the site	**Groundwater Analytical Results** • Sampling of MW01 was only completed during the April 2022 event, with one previous monitoring event in November 2020. The majority of PFAS compounds reported raised LOR due to sediment, with detections of PFHxA (Nov20 and Apr22) and PFPeA, PFHpA and 6:2 FTS (Nov20) reported. • MW74 reported detections of several PSA and PCA compounds, with all samples reporting concentrations of PFOS above the 99% species protection level. Concentrations of Sum of PFOS and PFHxS were reported to exceed the drinking water guideline during the December 2021, April 2022 and July 2022 events. • Concentration of PFAS in MW74 are observed to be increasing, with highest concentrations reported during the April 2022 monitoring event. **TOPA Analytical Results** TOPA analysis was completed on samples collected during the November 2020 sampling event, with TOPA and standard analytical results observed to generally be comparable (**Table T8**). On this basis, it is considered that groundwater at MW01 and MW74 are unlikely to contain an additional mass of PFAS precursors. **TOF Analytical Results** • Analysis for TOF was completed on samples collected during the November 2020 sampling event, with MW01 and MW74 reporting concentrations below the laboratory's LOR, indicating samples are unlikely to have a high percentage of other fluorinated organic compounds present.
Addendum CLID Groundwater Investigation (2023)	MW74		• Concentrations of PFOS (0.015 - 0.024 µg/L) remained within the range of historical monitoring results (November 2020 to July 2022, 0.0047 – 0.0304 µg/L), with all results reporting concentrations of PFOS above the 99% Species Protection limit of 0.00023 µg/L • All samples reported concentrations of the sum of PFHxS and PFOS (0.150 – 0.384 µg/L) above the drinking water criteria of 0.07 µg/L, with results showing an increasing trend from historical monitoring results (November 2020 to July 2022, 0.0248 – 0.187 µg/L) • All samples reported an increasing trend for PCA compounds (PFBA, PFPeA, PFHxA, PFHpA, PFOA and PFNA) and 6:2 FTS, with total PFAS reporting a significant increase following the March 2023 quarterly event (refer **Figure 24**)

Investigation Scope	Monitoring Location	Identified Risk/Target	Analytical Results
Initial CLID Surface Water Investigation (2022)	SW33 SW34 SW35 SW37† SW45 SW46† SW06 SW28* SW48*	Background monitoring location to assess upgradient surface water entering the site along the northern site boundary and leaving the site via the Western Stormwater Diversion Channel (WSDC)	• All samples reported detection of PFAS above the laboratory's LOR with the exception of SW33 (Jul22), SW35 (Jul22) and SW28 (Jul22) which reported raised LORs due to sediment loads, with LORs raised above historical detections. • Highest concentrations were reported in SW34, with concentrations of PFOS exceeding the 99% and 95% species protection levels, and Sum of PFOS and PFHxS exceeding the drinking water criteria in all events. Samples generally reported detections of PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA and 6:2 FTS, with two samples also reporting 8:2 FTS. Highest total PFAS concentrations were reported during the July 21 event (total PFAS 6.62 µg/L). • Remaining locations (SW06, SW28, SW33, SW35, SW37, SW45, SW46 and SW48) reported a high degree of variability, with at least one sample reporting PFOS concentrations above the 99% species protection limit. Locations SW06, SW33, SW35, SW37, SW45, SW46 and SW48 also reported at least one sample with PFOS concentrations above the 95% species protection limit and Sum of PFOS and PFHxS above the drinking water criteria.
Addendum CLID Surface Water Investigation (2023)	SW33 SW34 SW45 SW06 BS3-CWN BS3-CWE BS3-CW		• Results for SW33 were comparable to historical monitoring events with detection of PSA and PCA compounds generally within the historical range, noting the laboratory's LOR was raised for a number of analytes • Results for SW34 were generally comparable to historical monitoring events with detection of PSA and PCA compounds generally within the historical range. Concentrations of PFOS were reported above the 99% Species Protection limit of 0.00023 µg/L during the October 2022, December 2022 and January 2023 monitoring events, with concentrations also exceeding the 95% Species Protection limit of 0.13 µg/L during the October 2022 and January 2023 events (and reporting the highest PFOS concentration to date during the October 2022 event at 0.195 µg/L). Concentrations of the sum of PFOS and PFHxS were reported above the Drinking Water criteria of 0.07 µg/L, with both events within the historical range • Results for the BS3 clean water diversion channel (BS3-CWN, BS3-CW and SW45) reported highest concentrations in BS3-CWN, with concentrations of PFOS (0.301 µg/L) reported above the 95% Species Protection limit of 0.13 µg/L and the sum of PFOS and PFHxS (0.595 µg/L) reported above the Drinking Water criteria of 0.07 µg/L. All three locations reported detections of PSA and PCA compounds and 6:2 FTS, with concentrations showing a general reduction from the northern boundary (BS3-CWN) past BS3 (BS3-CW) and into the northern stormwater diversion channel (SW45). All three locations reported concentrations of PFOS above the 99% Species Protection limit and the sum of PFOS and PFHxS above the Drinking Water criteria, with PFOS also reported above the 95% Species Protection limit on at least one occasion.

Notes: † Monitoring location not included in additional investigations as detailed in the Addendum SAQP (Epic 2023a)
* Monitoring location along southern site boundary representing surface water exiting the site via the western stormwater diversion channel

10.3 Northern Boundary Results Discussion

Surface water results for samples collected along the northern site boundary generally report PFAS concentrations comparable to historical monitoring events (November 2020 to July 2022), with PFAS detected in all three watercourses entering the site along the northern site boundary. All results reported concentrations of PFOS above the 99% Species Protection limit of 0.0023 µg/L (or a raised LOR), with SW34, SW45, BS3 CW and BS3 CWN also reporting concentrations above the 95% Species Protection limit of 0.13 µg/L during at least one monitoring event and concentrations of the sum of PFOS and PFHxS above the Drinking Water criteria of 0.07 µg/L.

Highest PFAS concentrations (during the period of this Addendum CLID) were reported at SW34 which reported a total PFAS concentration of 2.19 µg/L in January 2023, with BS3 CWN reporting a total PFAS concentration of 2.03 µg/L in December 2022. The results indicate that the majority of PFAS mass is likely to enter the site's northern boundary via the northern watercourse east (SW34) and the northern watercourse BS3 (BS3 CWN), with lesser contribution from the northern watercourse central (SW33) and the eastern branch of the northern watercourse BS3 (BS3 CWE). Statistical analyses[7] of monitoring results from SW33 and SW34 is presented in **Table 30**, with results showing PFAS concentrations reported at SW34 are generally one to two orders of magnitude higher than concentrations reported at SW33.

Table 30. Northern Boundary Surface Water Statistical Analysis

Location	Analyte	Obs[1]	Non-detects[2]	Max	Min	Mean	Geo-mean	SD	95% UCL[3]
SW33	PFOS	5	8	0.0144	0.0032	0.00792	0.0069	0.00447	0.0122
	∑ PFOS & PFHxS	7	6	0.0233	0.0032	0.0125	0.0105	0.00696	0.0176
	Total PFAS	12	1	0.193	0.0124	0.0758	0.0597	0.0547	0.104
SW34	PFOS	18	0	0.195	0.0575	0.125	0.12	0.036	0.140
	∑ PFOS & PFHxS	18	0	0.481	0.136	0.272	0.257	0.0939	0.311
	Total PFAS	18	0	6.62	0.761	2.406	2.046	1.487	3.016

Notes: [1] Number of observations above laboratory's limit of reporting
[2] Number of observations below laboratory's limit of reporting
[3] Student's-t UCL

Results from the current investigation support previous findings that high concentrations of PFAS are entering the site via the watercourses along the northern site boundary, with PFAS concentrations observed to decrease as water travels along the northern and western stormwater diversion channel. The observed reduction is likely to be associated with mixing and dilution with other surface water inputs with no, or lower concentrations of PFAS. Concentrations of PFAS reported at SW28, at the southern extent of the Western Stormwater Diversion Channel (southern boundary of the site, refer **Figure F3**) reported PFAS concentrations approximately one to two orders of magnitude lower, however concentrations of PFOS were still reported above the 99% Species Protection limit.

It is noted that monitoring of surface water runoff from the rehabilitated ash dam BS3 (Ash Dam 3) reported concentrations of PFAS below the laboratory's LOR in January 2023, with PFOS (0.0003 µg/L) reported marginally above the LOR of 0.0002 µg/L in December 2022. Based on current and historical monitoring of runoff from BS3, the rehabilitated Ash Dam 3 is not considered to comprise a PFAS source area, or be contributing to PFAS concentrations observed along the northern site boundary or further downstream.

Groundwater results for MW74 reported detectible concentrations of PFAS compounds, with MW74 reporting concentrations of PFOS (0.015 - 0.0224 µg/L) above the 99% species protection limit and Sum of PFOS and PFHxS PFOS (0.150 – 0.384 µg/L) above the drinking water criteria during the current monitoring events (November 2022 to December 2023).

[7] Statistical analysis was completed using ProUCL 5.2, with calculations presented in **Appendix R**.

Groundwater monitoring well MW74 is located adjacent to the northern drainage channel (east), with surface water sampling location SW34 located adjacent and upstream at the railway line culvert. Previous investigations (Epic 2022a) reported that groundwater located along the northern site boundary (as represented by MW74) is likely to have been impacted from surface water entering the northern site boundary from the area of the mine (operated by Batchfire), with the composition of PFAS compounds comparable between MW74 and SW34 across all monitoring events. Results from the current monitoring events supports previous conclusions, with PFAS composition remaining comparable between MW74 and SW34 (**Figure 22**). Current results have however, reported an increase in total PFAS concentrations at MW74, with a corresponding decrease observed in SW34 (refer **Figure 23** and **Figure 24**), noting however that monitoring of SW34 was not completed after January 2023. The increase in PFAS concentrations at MW74 is attributed to increases in PFHxS, PCA compounds (PFBA, PFPeA, PFHxA, PFHpA, PFOA and PFNA) and 6:2 FTS, with PFOS concentrations remaining stable across all monitoring events. The increases observed in these compounds during March to December 2023 is reflected in the PFAS composition data as shown in **Figure 22**.

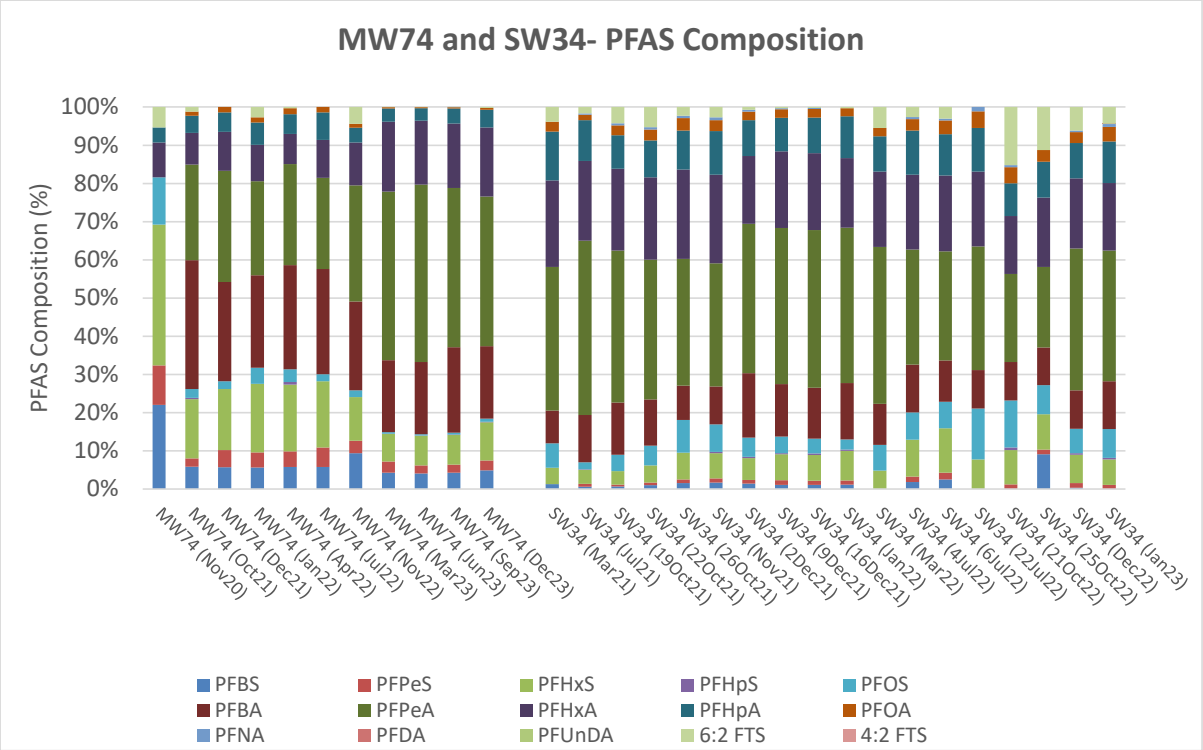


Figure 22. MW74 and SW34 – PFAS Composition in Groundwater (MW74) and Surface Water (MW34)

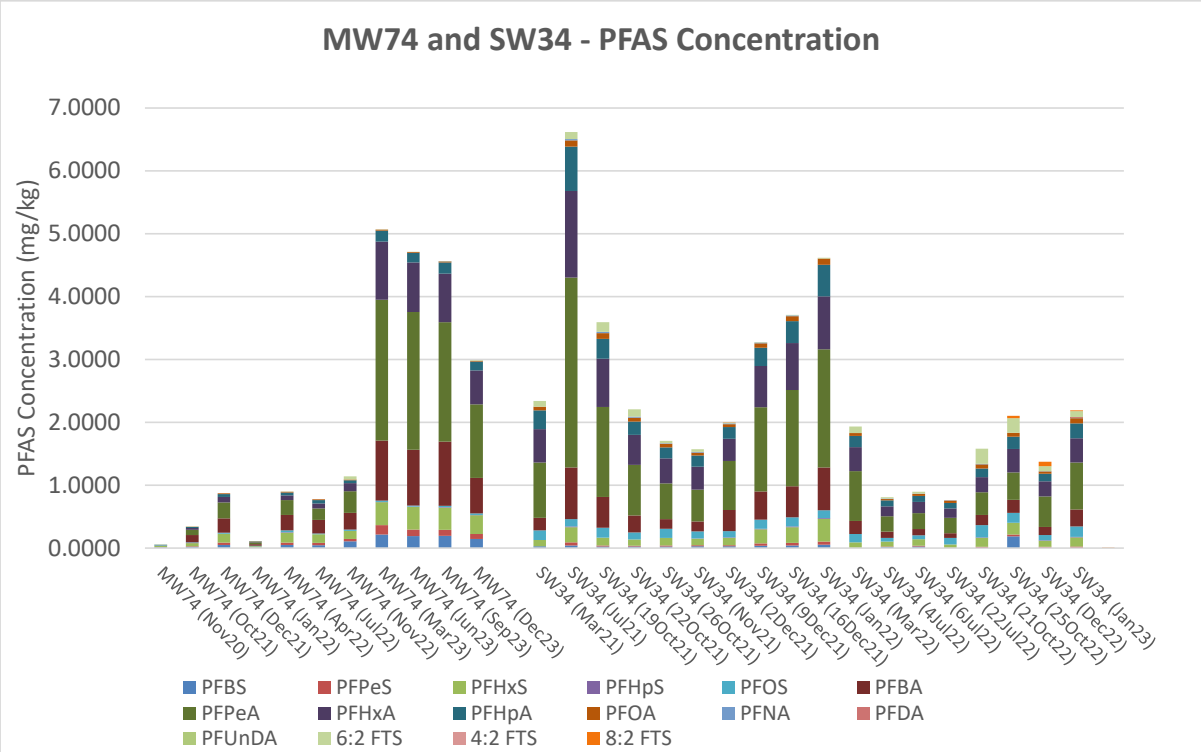


Figure 23. MW74 and SW34 – PFAS Concentration

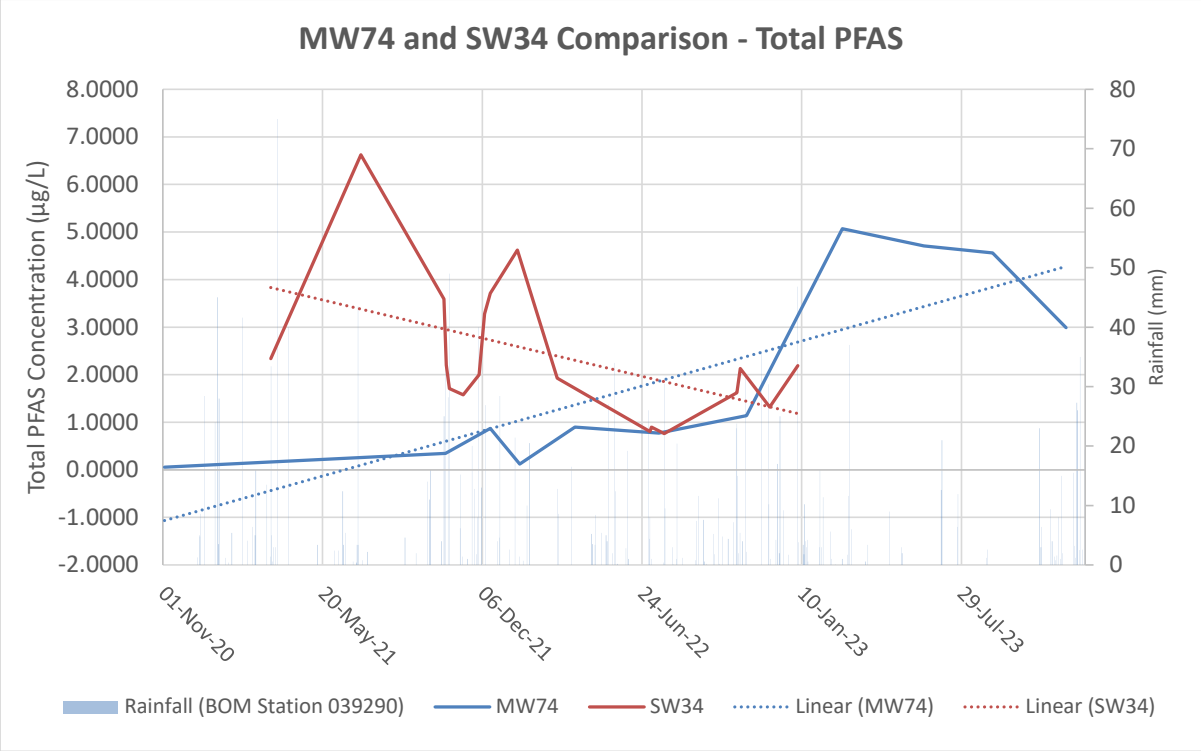


Figure 24. Total PFAS Concentration Trend – MW74 and SW34

10.4 Northern Boundary Flow Monitoring

CS Energy installed two LoRaWAN LDDS75 Distance Detection Sensors at the stormwater culverts adjacent to SW33 and SW34 to provide real time monitoring of water levels within the culverts. Sensors were installed in February 2023 as a temporary monitoring solution prior to installation of a more permanent solution, and recorded data between 5 February 2023 and 5 February 2024. Review of data recorded indicates no clear correlation between site recorded rainfall and water levels within the culverts. **Figure 25** shows an extract from the sensor output which indicates a potential response in SW33 from rainfall recorded on 22 December 2023, however no response is recorded on 17 December 2023 for corresponding rainfall, and SW34 reports no response associated with any reported rainfall and an erroneous response on 7 January 2024. Both sensors report loss of signal between 22 December 2023 and 2 January 2024. Inspection of the sensors noted the presence of insects (webs and nests) obstructing the sensors and preventing accurate readings. A copy of the sensor outputs is included in **Appendix S**.

On the basis that suitable data was not able to be obtained, calculation of the mass flux of PFAS entering the site along the northern site boundary has not been completed.

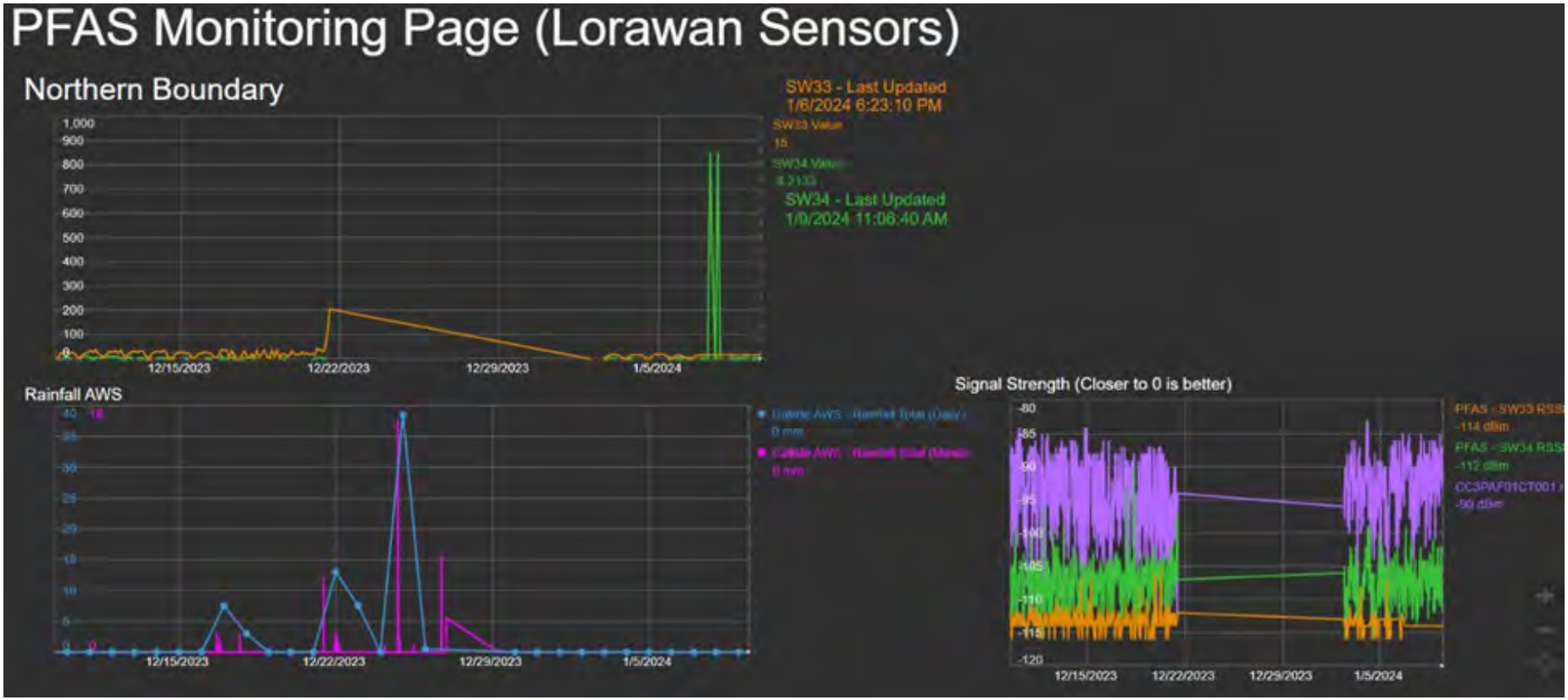


Figure 25. Northern Boundary Sensor Example Output

To enable monitoring of water flows entering the site along the northern boundary, CS Energy have commissioned Hydrobiology to install the following engineering solutions at the site:

- SW34 – Concrete ford crossing consisting of a custom designed concrete apron to allow for the calculation of flow rates and monitoring.
- SW33 – Installation of a submersible pressure transducer and depth velocity sensor within the existing concrete culvert

Installation of the engineering solutions is proposed to be completed by mid 2024.

11 AQUATIC BIOTA (DATA GAP 7)

Desktop review completed as part of the Initial CLID (Epic, 2022c) identified 9 target locations and target species for aquatic biota sampling to assess risk to human and ecological receptors.

Hydrobiology Pty Ltd (Hydrobiology) was subcontracted to complete an aquatic biology assessment in accordance with the Biota Sampling Plan provided in Appendix E of the Initial CLID (Epic, 2022c). The investigation was completed in early February 2023 and assessed the biota tissue contaminants, habitat condition, macroinvertebrate community and aquatic biota of each target sampling site.

Table 31. Aquatic Biota (Data Gap 7) Summary

Information sourced from Addendum SAQP (Epic, 2023a) and CLID (Epic, 2022c)

Aspect	Details
Initial CLID Data Gap (Epic, 2022c)	Potential risks to human and ecological health have been identified. Further assessment of risk will be required to be completed to quantify potential risks to human and ecological receptors. It is noted that biota sampling is proposed to be completed to inform potential risks to ecological receptors.
Initial CLID Recommendation (Epic, 2022c)	Completion of proposed biota sampling is recommended to be undertaken during the next wet season period. Sampling should be undertaken in accordance with the sampling plan. Following completion of biota sampling, a Human Health and Ecological Risk Assessment (HHERA) should be completed to assess potential risks to human health and ecological receptors.
Previous Investigation	Epic completed a desktop review to inform the approach for completion of aquatic biota sampling to satisfy the requirements of the EE that relate to biota, human consumption of biota, and bioaccumulation risk. The desktop assessment identified target species and sampling locations, with five primary, and three secondary target species identified to enable assessment of ecological and human health risks, as detailed in **Table 32.** Sampling was proposed to be completed at seven sampling sites within the investigation area (Callide Creek catchment/Callide Dam), along with one control site (upstream of Callide Dam) and one reference site (located in the adjacent Kroombit Creek catchment).

Table 32. Selected Target Species (Epic, 2022c, Appendix E)

Target Species		Intended Main Indicator Type[1]	
Primary Species	**Secondary Species**	**Human Health Risk**	**Ecological Risk**
Barramundi (*Lates calcarifer*)	Golden Perch (*Macquaria ambigua*)	✓	×
Eel-tailed Catfish (*Tandanus tandanus*)	-	×	✓
Eastern Rainbowfish (*Melanotaenia splendida splendida*)	Spangled Perch (*Leiopotherapon unicolour*)	×	✓
Redclaw Crayfish (*Cherax quadricarinatus*)	Freshwater yabby (*Macrobrachium* sp.)	✓	×
Fresh water mussels (*Velesunio* sp.)	-	×	✓

[1] The intended main indicator type for each species is identified in this table. It is noted that all of the selected human health risk indicators can also serve as ecological risk indicators. If necessary, the main indicator type designations can be modified during the sampling program (e.g. some human health risk indicators could also be used as ecological risk indicators) depending on the species present and abundance of individuals at each site.

11.1 Aquatic Biota Investigation Scope

Hydrobiology undertook aquatic biota investigations in accordance with the Biota Sampling Plan provided in Appendix E of the Initial CLID (Epic, 2022c) between 30 January 2023 and 3 February 2023. Investigations were completed in accordance with the Biota Sampling Plan and Queensland and Commonwealth guidelines and licence requirements, and included:

- Habitat condition assessments

- Macroinvertebrate sampling
- Collection of aquatic biota to inform the human and ecological health risk assessments

11.2 Investigation Results and Discussion

A summary of results from the aquatic biota investigation is provided in **Table 33**, with the Hydrobiology report containing further details on investigation findings and results included in **Appendix M**.

Table 33. Summary of Aquatic Biota Investigation Results

Investigation Scope	Locations	Identified Risk/Target	Results
Ecological and Contaminants Report, Hydrobiology (July 2023)	• AB1: Upstream Callide Creek (Control) • AB2 and AB3: Lake Callide • AB4 to AB8: Downstream Callide Creek • AB9: Lake Kroombit (Reference)	Habitat condition, macroinvertebrate biodiversity and assessment of potential risk to human and ecological receptors	• Habitat condition, aquatic biota, and macroinvertebrate communities varied between control/ reference sites and test sites • Upstream of Callide Dam within Callide Creek habitat condition was excellent and aquatic biota and macroinvertebrates were abundant and diverse for this system • Evidence of disturbance was present within Callide Creek downstream of the site based on habitat condition, water quality and macroinvertebrate assemblages • Habitat quality overall was in good to excellent condition with most sites limited due to lower water depth, availability of micro and macrohabitats and by fine sediment content • Lake Callide was able to support similar, and in some cases more diverse aquatic biota and macroinvertebrates communities than the reference site Lake Kroombit • Dissolved oxygen was low across all sites, in particular downstream of Lake Callide • PFOS was detected in biota samples collected from sites along Callide Creek both upstream and downstream of the Callide Power Station • PFOS was not detected in biota samples collected from within Lake Callide and Lake Kroombit • Highest concentrations of PFOS were recorded at the furthest site downstream from the site (SW41, Callide Wier) • Concentrations of metals and fluoride in biota samples did not show an obvious trend between control/reference sites and test sites • Where guidelines were available most metals/metalloid concentrations were below guideline values, except for zinc • Zinc concentrations were above guideline levels regardless of species or site, and likely to be indicative of regional influences rather than impacts associated with the power station

11.3 Aquatic Biota Results Discussion

Historical surface water sampling within Callide Creek has reported concentrations of Perfluoroalkyl Sulfonic Acids (PFBS, PFPeS, PFHxS, PFHpS and PFOS) and Perfluoroalkyl Carboxylic Acids (PFBA, PFPeA and PFHxA) and Fluorotelomer Sulfonic Acids (6:2 FTS) compounds, with sampling completed within Callide Dam reporting detections of PFBS, PFPeA and PFHxA on one occasion.

Results from aquatic biota sampling reported detections of PFAS in 15 of the 40 samples collected, with 14 samples only reporting detections of PFOS, and one sample (AB4-TT-EP, eeltail catfish) reporting detections of PFOS (4 µg/kg) and PFHxS at the laboratory's LOR of 1 µg/kg. It is noted that a number of PFAS compounds detected in surface water are not considered to be bioaccumulative and as such would not be expected to be detected in biota samples.

One sample collected upstream of Callide Dam (AB1-PR-EP, Rendahl's Catfish, 2 µg/kg) reported concentrations of PFOS marginally above the laboratory's LOR of 1 µg/kg (and below both the human health and ecological criteria), with remaining samples collected from Callide Dam, Callide Creek upstream of Callide Dam and Kroombit Dam reporting no detectible PFAS.

Comparison of PFOS concentrations in aquatic biota with average concentrations of PFOS in corresponding surface water monitoring locations (**Figure 26**) indicates highest concentrations of PFOS in aquatic biota are generally associated with highest average surface water concentrations, with higher concentrations reported in samples collected furthest downstream of the site at the Callide Weir. It is noted that monitoring locations further downstream from the site comprised larger waterbodies and included the Callide Weir, which may also contribute to higher concentrations in aquatic biota due to the presence of increased habitat complexity to support biota and longer residence times due to greater availability of food sources. This longer residence time could be a contributing factor to the higher PFOS levels. It is also noted that the Callide Weir is situated in an area that may include other PFAS sources such as industrial land uses, historical firefighting activities and historical agriculture facilities.

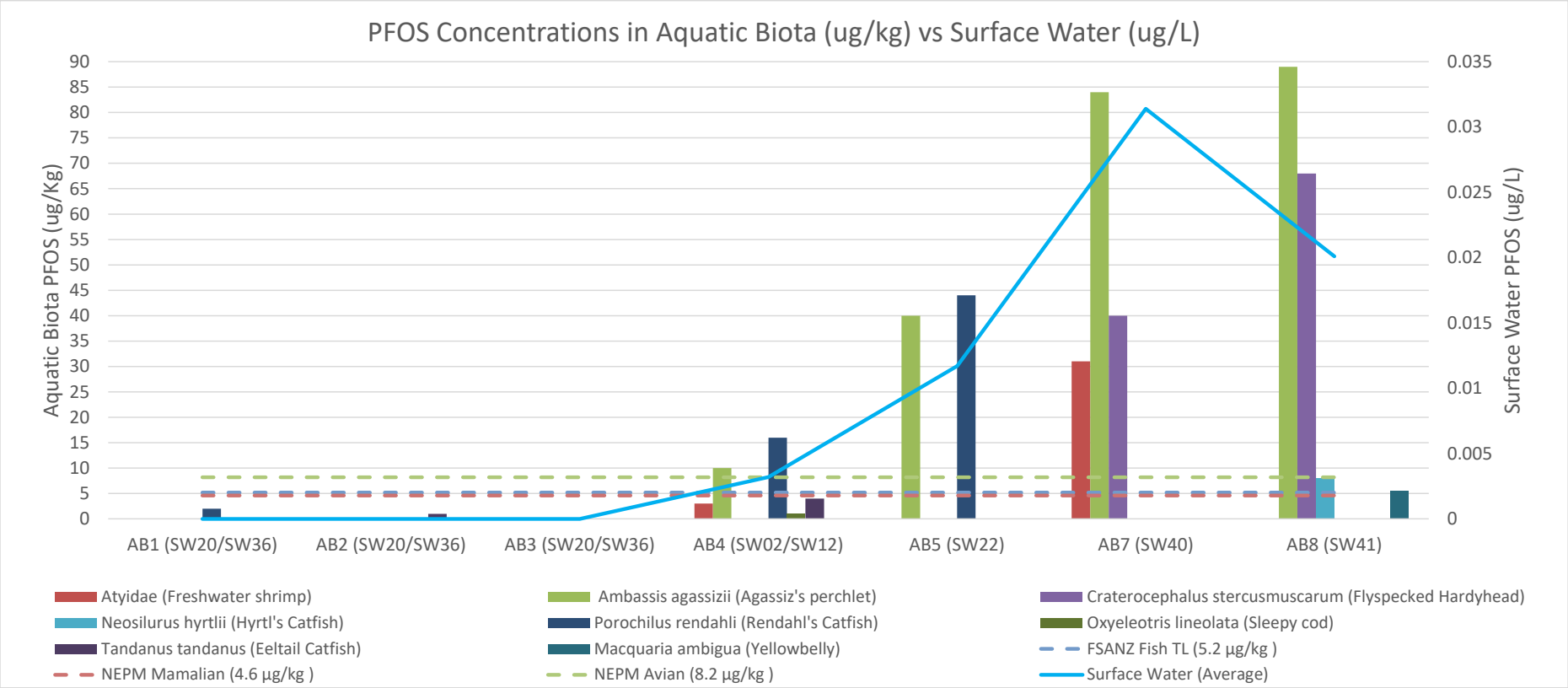


Figure 26. PFOS Concentrations in Aquatic Biota vs Surface Water

11.3.1 Potential Human Health Risks

A total of four of the target human health species (three catfish species and one Yellowbelly) reported concentrations of PFOS exceeding the Food Standards Australia and New Zealand (FSANZ) trigger point criteria (FSANZ, 2017) for fish of 5.2 µg/kg for PFOS[8], with a maximum concentration of 44 µg/kg reported in sample AB5-PR-EP (Rendahl's Catfish). It is noted that one of these samples (AB8-MA-EP, Yellowbelly from Callide Weir) reported concentrations of PFOS within edible portions (fillets) below the criteria, however analysis of the remaining portions (i.e. frame, gills, organs) reported concentrations above the criteria.

PFAS was not detected in any of the human health target species sampled from Callide or Kroombit Dams (including Barramundi and Red Claw Crayfish).

11.3.2 Potential Ecological Risks

A total of 12 samples reported concentrations of PFOS exceeding the PFAS NEMP biota guideline value (for sum of PFOS and PFHxS) for mammalian diet (4.6 µg/kg[9]), with nine of these samples also exceeding the guideline value for avian diet (8.2 µg/kg). All exceedances were reported in sampling locations within Callide Creek downstream of the site (AB4 to AB8). The highest concentration of 89 µg/kg was reported in sample AB8-AA-WB (Agassiz's Perchlet) within Callide Weir.

With the exception of sample AB8-MA-EP (Yellowbelly from Callide Weir) only edible portions were analysed for target human health species, and additional samples close to the biota guideline values (i.e. AB4-TT-EP) may exceed where whole body concentrations are considered (noting sample AB8-MA-EP reported comparable concentrations of PFOS in edible and non-edible portions).

[8] The FSANZ trigger point criteria was calculated using the body weight of a small child (2-6 years old, 19kg) and consumption of 73g of fish per day. The FSANZ trigger limit is designed to inform where additional assessment of potential risk would be required and is considered to be conservative trigger limit.

[9] It is noted that the Department of Climate Change, Energy, the Environment and Water's 2022 Draft PFAS National Environmental Management Plan Version 3.0 (PFAS NEMP 3.0), currently issued for public consultation and not yet endorsed by the QLD Regulator (DES), proposes a revised mammalian diet guideline value of 3.1 µg/kg. Review of results indicates that one additional sample (total of 13) would exceed the proposed revised mammalian diet guideline value.

12 SOIL REMEDIATION (FIRE TRAINING GROUND AND FUEL OIL TANKS)

Soil investigations completed as part of the Initial CLID (Epic, 2022c) confirmed the fuel oil tanks (FOT) and fire training ground (FTG) as primary PFAS source areas, associated with the historical use of AFFF at both locations. As noted in the Initial CLID (Epic, 2022c), CS Energy had appointed a remediation contractor (Enviropacific Services Limited) to undertake remediation of the FTG and FOT area.

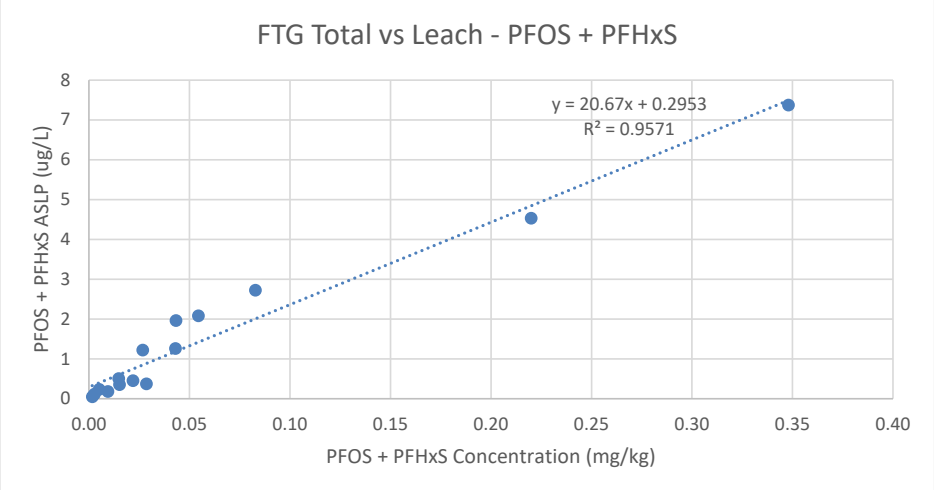
Remediation works were completed between October 2022 and August 2023 and included excavation of soil with elevated PFAS concentrations, chemical stabilisation through addition of powdered activated carbon (PAC) and physical amelioration with bentonite prior to reinstatement of the soil.

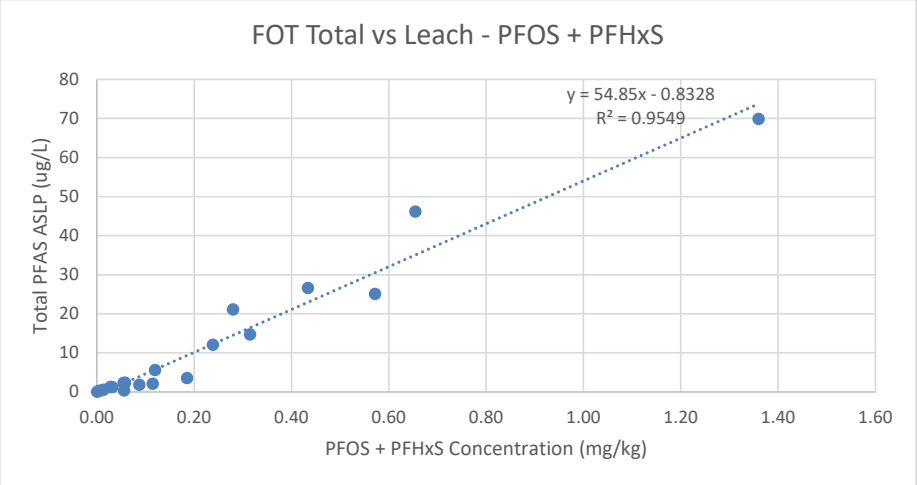
It is noted that remediation of PFAS soil source areas was not required to be completed as part of works associated with the EE, with remediation and validation works completed as part of CS Energy's ongoing management of PFAS at the Callide Power Station site. A summary of relevant remediation works, including supporting documentation, has been included for completeness, noting that completion of remediation works occurred concurrently with the addendum EE investigation scope. Furth details of remediation works, including the remediation options assessment, adopted remediation methodology and remediation and validation works will be reported separately to this addendum EE report.

A summary of the soil remediation works is presented in **Table 34**, with validation sample locations presented on **Figure F10** (FOT) and **Figure F11** (FTG). Laboratory documentation provided in **Appendix K**.

Table 34. Soil Remediation Summary

Aspect	Details
Initial CLID Recommendation (Epic, 2022c)	Remediation of PFAS impacted soils identified at the fire training ground and fuel oil tanks should be undertaken to the extent practicable to prevent or minimise potential ongoing risks to ecological and human health receptors. Highest concentrations of PFAS were reported in areas immediately surrounding the Fuel Oil Tank bund and the Fire Training Ground bund, and are considered to represent the extent of primary impacts associated with the historical use/release of AFFF, however, it is noted that residual impacts in surrounding areas was reported. It is noted that at the time of reporting, CS Energy has appointed a remediation contractor to undertake remediation of the FTG and FOT area. Remediation is proposed to comprise onsite stabilisation through addition of a powered activated carbon product.
Background and History	**Fuel Oil Tanks** The FOT contains a low expansion foam system, with 4,400L aboveground AFFF holding tank. Two release events (training) were reported to have historically occurred, with each releasing approximately 2,000L of AFFF. Released foam filled a primary containment bund (concrete), with wind drift of foam reported to occur over the adjacent fire water tank area (limited and sporadic coverage). ERT training events (simulation of fire in bund) were also completed at the Fuel Oil Tank area, with foam released to the adjacent roadway and grassed areas. Less than 20L of AFFF reported to have been used during each event, over several training events. Equipment was reported to be flushed onsite onto the adjacent grassed area. It is estimated that up to approximately 100L of AFFF concentrate has historically been released around the Fuel Oil Tank. **Fire Training Ground** The FTG area consists of a concrete slab with primary bund, with secondary concrete bunds located within the main bund, and used for specific training scenarios. Training was reported to be completed using AFFF (<20L per event) and extinguishers, with approximately 10 to 15 training events estimated to have occurred. The primary bund was observed to be incomplete on the north-west and north-east corners (missing sections of bund), with water able to discharge to ground and then to the DRD via an earthen stormwater channel. It is reported that residual materials were not removed, and the bunded area was not cleaned following training.

	It is estimated that between 60L to 200L of AFFF concentrate was historically released at the FTG.
Previous Investigation	Based on the results of initial site investigations (Epic 2021a) which identified PFAS impacts associated with historical AFFF use at the FOT and FTG, a detailed soil investigation was undertaken to delineate the vertical and lateral extent of PFAS soil contamination and inform remediation and/or management of impacts, as reported in Epic, 2022c. A total of 82 investigation locations were advanced at the site in October 2021, with details outlined in the EE CLID (Epic, 2022c). Review of analytical results for the FTG reported a range of variability in PFAS composition and concentration. Locations in close proximity to the concrete bund reported the detections of PSAs, PCAs and Fluorotelomer Sulfonic Acid (FSA) compounds, with the southern laydown area and embankment areas generally only reporting the presence of PSA and PCA compounds. Samples collected in drainage lines and surface water flow paths reported detection of the most PFAS compounds, with samples FTG-Sed1 and FTG-Sed2 reporting detection of 20 of the 28 PFAS compounds analysed. No clear trend or PFAS signature is visible in soil data from the FTG, which may indicate a number of different foam products have been utilised during training activities. It is noted that the composition of PFAS reported at the FTG does not match composition of recent Ansulite foams reported to have been used at the site which show a signature of mostly PCA compounds. Leachability results mirrored soil results, with a high degree of variability in PFAS compositions. Leachability results for ASLP and Toxicity characteristic leaching procedure (TCLP) methods were generally comparable in composition, with higher concentrations reported for leachability analysis performed under neutral conditions (ASLP). Concentration of PFOS, the sum of PFOS and PFHxS and Total PFAS at the FTG were reported to be leachable at an average of 52%, 56% and 66% of the total concentration respectively (refer **Table T7**). A strong linear relationship was reported between ASLP and total concentrations (**Figure 27**) enabling prediction of likely leachability of remaining samples.  **Figure 27. Fire Training Ground Soil Leachate Comparison (Epic, 2022c)** Based on the history of the FTG area, it is considered that PFAS results in soil reflect the historical use of multiple AFFF products for training purposes. Review of analytical results for the FOT reported comparable PFAS composition across the majority of test locations, with perfluoroalkyl sulfonic acid compounds comprising the main functional group and PFOS the main compound by percent composition. One notable exception is FOT18, located adjacent to the AFFF storage tank area which reported approximately 70% fluorotelomer sulfonic acids by percent composition, with the main contribution being 6:2FTS.

	Results indicate that historical use and release of AFFF at the fuel oil tanks is likely to be associated with a singular (or small number of) foam product, with the possibility of a small, localised spill event or release adjacent to the AFFF tank (as represented by the different composition observed in FOT18). It is noted that the composition of PFAS reported at the FOT does not match composition of recent Ansulite foams reported to have been used at the site which show a signature of mostly PCA compounds and is likely indicative of historical foam products used at the site. Leachability results mirrored soil results, with similar PFAS compositions. Leachability results for ASLP and TCLP methods were generally comparable in composition, with higher concentrations reported for leachability analysis performed under neutral conditions (ASLP). Concentrations of PFOS, the sum of PFOS and PFHxS and Total PFAS at the FOT were reported to be leachable at an average of 72%, 74% and 79% of the total concentration respectively (refer **Table T7**). A strong linear relationship was reported between ASLP and total concentrations enabling prediction of likely leachability of remaining samples (**Figure 28**).  **Figure 28. Fuel Oil Tanks Soil Leachate Comparison (Epic, 2022c)**
Proposed Remediation Strategy	The remediation strategy proposed by Enviropacific comprised chemical stabilisation of PFAS impacted material onsite to reduce the leachability of the residual PFAS mass present in soils. Further details are included in Enviropacific's Remediation Plan provided in **Appendix P**. Based on the results of soil investigations, a soil remediation criteria of 0.04 mg/kg was adopted to inform soils requiring remediation. The adopted criteria was based on the investigation results, and the primary objective of minimising ongoing contribution of PFAS from soil to groundwater pathways at concentrations which may exceed the Drinking Water Guideline Criteria of 0.07 µg/L. All soils within accessible areas with concentrations of the sum of PFOS and PFHxS at or above 0.04 mg/kg were proposed to be remediated at the FOT and FTG.
Bench-Scale Treatment Trial	A bench-scale treatment trial was completed by Enviropacific (2022) on soils collected from the FTG and FOT to confirm the suitability of the adopted remediation strategy. This successful trial demonstrated the effectiveness of the adopted chemical stabilisation method, including the nominated application rate of PAC of 0.5% v/v, with a 100% reduction in leachable concentrations of PFHxS + PFOS following treatment. These results were repeated following a 240-hour multiple extraction procedure (MEP) providing evidence of the long-term efficacy of treatment. A copy of the treatment trial report is provided in **Appendix P**.
Remediation Methodology	Remediation of accessible soils exceeding the soil remediation criteria of 0.04 mg/kg was completed as follows: • Impacted material was excavated in discrete lots (up to 250 m^3) and transported to the treatment area under EPS's Inspection and Test Report (ITR) system.

	• Testing of each 250 m^3 stockpile was completed to determine the pre-treatment leachability. • Excavated material was treated through the application of PAC at a nominal rate of 0.5% v/v using high-shear mixing (pug mill) and bucket mixing (for soil beneath the FTG bund) to ensure adequate mixing of material. • A nominal application of 2% v/v of bentonite was added to the soils to further reduce soil permeability. • Following treatment, material was stockpiled and validated in 100 m^3 lots through laboratory analysis to confirm the reduction in leachable PFAS concentrations. • Where leachable concentrations report a >95% reduction, material was deemed to have been successfully treated. • Prior to reinstatement, a guard layer of 20kg PAC per 100 m^2 was applied to the excavation base. • Following treatment, validated material was reinstated within the excavation and compacted in discreet 0.3m layers to a 95% compaction under level 1 geotechnical supervision. • Backfilled excavations were profiled to pre-existing landform and revegetated with shallow rooted perennial Couch or Rhodes grass.
FTG Concrete Bund	Remediation of the concrete bund located within the FTG was initially completed through application of Xypex Megamix I and Xypex X55 to permanently seal the concrete and prevent potential leaching of PFAS from the existing concrete surfaces. Monitoring of accumulated rainfall captured in the bund reported elevated concentrations of PFAS, indicating that the treatment was unsuccessful in meeting the remediation objective. On this basis, concrete material comprising the FTG bund was excavated and disposed to a licenced facility, with remediation of soils located beneath the concrete bund conducted in accordance with the remediation methodology adopted for remaining areas. A total of 153.02 tonnes of concrete material was disposed to BMI's Stapylton Resource Recovery facility on 22 August 2023. Based on an average total PFAS concentration in concrete of 0.6 mg/kg, the total mass of PFAS removed from the site in concrete is estimated to be approximately 0.1 kg.

12.1 Soil Remediation Validation Scope

To confirm that remediation was successfully completed, Epic undertook the following validation works during remediation:

- Excavation depths were assessed to confirm a suitable depth of material had been removed in accordance with the remediation plan
- Photographic evidence was collected of excavated surfaces
- Validation of treated soils to confirm material met the nominated validation criteria (>95% reduction in leachability). Validation of treated stockpiles at a rate of 1 sample per 10 primary validation samples collected by Enviropacific
- Collection of wall and base validation samples at a rate of 1:10 linear metres at each 0.5 m depth interval

12.2 Soil Remediation Validation Analytical Results

12.2.1 Treatment Validation Samples

Epic collected post treatment validation samples at a rate of 1 sample for every 10 validation samples collected by Enviropacific, to verify validation results. Enviropacific reported an average reduction in leachable concentrations of total PFAS of 99.72% in all validation samples. Of the three verification samples collected by Epic, a 99.71% average reduction in concentrations of leachable total PFAS was reported.

All samples reported a reduction in leachable PFAS >95%, with a summary of post treatment results presented in **Table 35**, with full results presented in **Table T10** and **Table T11**. Laboratory documentation is included in **Appendix Q.**

Table 35. Treatment Validation Verification Results

Enviropacific Untreated Sample ID	Eurofins - Sum of PFHxS & PFOS on ASLP Untreated (µg/L)	Enviropacific Treated Sample ID	Sum of PFHxS & PFOS on ASLP Treated (µg/L)	Epic Sample ID	Sum of PFHxS & PFOS (µg/L)	Reduction in leachability
FOT A1 SP2	71.4	FOT Area 1 SP2 Treated 1 FOT Area 1 SP2 Treated 2 FOT Area 1 SP2 Treated 3	0.09 0.07 0.08	FOT A1 SP1	0.06	99.92%
FOT A1 SP3	15.7	FOT Area 1 SP3 Treated 1 FOT Area 1 SP3 Treated 2 FOT Area 1 SP3 Treated 3 FOT Area 1 SP3 Treated 3 Dup	0.05 0.09 0.06 0.06	FOT A1 SP2	0.09	99.43%
FOT A1 SP5	45	FOT Area 1 SP5 Treated 1 FOT Area 1 SP5 Treated 2	0.09 0.01	FOT A1 SP5	0.09	99.80%

12.2.2 Excavation Validation Results

A summary of the soil analytical results by validation excavation area are presented in **Table 36**, with full results presented in **Table T10** and **Table T11**. Laboratory documentation is included in **Appendix Q**. One of the remediation areas (Area 3) at the Fire Training Ground (FTG) reported concentrations below the adopted soil remediation criteria, with remaining areas reporting samples above the adopted soil remediation criteria.

It is noted that due to site constraints including existing roadways, structures and the site topography, remediation of target remediation areas was not able to be completed to remove all residual impacts.

Table 36. Summary of Soil Analytical Results for PFOS & PFHxS by Area (Site Remediation Criteria)

Validation Area	Min	Max	*Standard Deviation*	*Locations with exceedances*
Fuel Oil Tanks (FOT)				
Area 1	0.0043	1.86 (FOT-A1-V12-1.0)	0.42	All (except V03, V04, V06)
Area 2	0.0119	2.1 (FOT-A2-V5_1.0)	0.64	All
Area 3	0.0016	0.394 (FOT-A3-V09-0.5)	0.097	All (except V01, V02, V06, V07, V08, V011, V012, V013, V017)
Area 4	0.0076	0.659 (FOT-A4-V01-0.5)	0.23	All (except V02, V06)
Fire Training Ground (FTG)				
Area 1	0.0037	0.32 (FTG-A1-V1_1.0)	0.10	All (except V2, V4, V6, V7)
Area 2	0.0003	0.274 (FTG-A2-B4)	0.062	V4C, B4, B4A, V6, V7
Area 3	0.0036	0.0326	0.011	None

Note: Highlighted cells exceed the adopted soil remediation criteria of 0.04 mg/kg for the sum of PFOS and PFHxS

12.3 Soil Remediation Discussion

Based on the proposed remediation scope, and in consideration of limitations associated with existing site infrastructure and features that prevented full remediation of areas, the remediation and validation of PFAS impacted soils at the FOT and FTG is considered to have been completed successfully to meet the remediation objectives. A total of 2,302 m^3 of soil from the FOT and 852 m^3 from the FTG was treated, equating to the

stabilisation of approximately 1.3 kg of PFAS[10] as shown in **Table 37**. Following treatment, soils reported a reduction in the leachability of PFAS of >99.7%.

Table 37. Estimated Mass of PFAS Chemically Stabilised

Aspect	FTG	FOT Area 1	FOT Area 2	FOT Area 3	FOT Area 4	Total
Volume treated (m^3)	825	764	401	1,058	79	3,127
Tonnes treated soil (1.5 t/m^3)	1,237.50	1,146.00	601.50	1,587.00	118.50	4,690.50
Pre-treatment ASLP (average Sum of PFOS and PFHxS) (µg/L)	0.1450	34.1725	24.9667	4.1733	18.76	-
Pre-treatment ASLP (average Total PFAS) (µg/L)	0.2500	36.03	26.1333	4.5200	22.72	-
Predicted concentration – Sum of PFOS and PFHxS (mg/kg)	0.0213	0.06382	0.047036	0.09127	0.35721	-
Predicted concentration – Total PFAS (mg/kg)	0.02638	0.67207	0.49163	0.09759	0.4294	-
Total Mass – Sum of PFOS and PFHxS (kg)	0.02636	0.73138	0.28292	0.14484	0.04233	1.22784
Total Mass – Total PFAS (kg)	**0.03265**	**0.77019**	**0.29572**	**0.15487**	**0.05088**	**1.30431**

Note: Predicted concentrations based on correlation of total and leachate results (refer **Figure 27** and **Figure 28**)

Residual soil impacts remain at both the FOT and FTG, with a number of wall and base validation samples reported to exceed the remediation criteria of 0.04 mg/kg. Residual impacts were generally reported in wall validation samples representing material extending to existing site infrastructure including below roadways, service easements and retaining walls, with material considered to be capped through the reinstatement and compaction of excavated material. It is noted that surrounding areas not included in the remediation works also reported low concentrations of PFAS. Remediation at these locations was dictated by the practicalities of remediating around in-service infrastructure. However, it is anticipated that the remediation conducted will slow the horizontal and vertical movement of PFAS from surrounding material.

Based on the results of remediation and validation works, it is recommended that the results of remediation and validation works, along with previous investigation of the surrounding area be used to inform the ongoing, and future management of soils at the FOT and FTG. In addition, the FOT and FTG should be incorporated into CS Energy's Site Permit to Work (PTW) and Penetration Permitting systems to identify residual soil impacts and ensure appropriate management of potentially PFAS-impacted soils and wastes generated during future ground disturbance activities. Following decommissioning and removal of existing infrastructure additional remediation should be completed to manage residual PFAS impacts.

[10] The Initial CLID (Epic, 2022c) notes that the residual mass of PFAS at the fire training ground and fuel oil tanks at Callide B and C Stations was estimated to be approximately 4.8 kg. Review of these calculations based on the results of the soil remediation program indicates the residual mass of PFAS at the FTG and FOT is likely to be between 3 to 4 kg, with approximately 1.3 kg considered to be successfully stabilised, and 0.1 kg removed (equating to approximately 35 to 47 % of the estimated mass), and the remaining PFAS mass between 1.7 to 2.7 kg.

13 GROUNDWATER AND SURFACE WATER MONITORING (QUARTERLY)

Quarterly groundwater and surface monitoring was completed in October/November 2022, and January/February 2023, March 2023, June 2023, September 2023 and December 2023 in accordance with the Addendum SAQP (Epic, 2023a) and as detailed in **Table 8** (**Section 5.1**). Quarterly monitoring results are presented in **Table T1**, **Table T2** and **Table T3**, with monitoring locations presented on **Figure F2** (groundwater) **Figure F3** (surface water). Laboratory results are included in **Appendix K**.

13.1 Groundwater Standing Water Levels

Groundwater flow across the site is generally consistent with topography, with groundwater generally flowing from the northeast boundary down to the southwestern boundary of the site. Localised variations in groundwater elevation are observed onsite with the following notable influences present on, and immediately surrounding the site:

- The water stored within the evaporation ponds is believed to have previously infiltrated into the underlying weathered bedrock aquifer. Historically, seepage from some of the evaporation ponds discharged into the WSDC and Ash Dam B, however subsequent filling of the A Zone evaporation ponds with ash is believed to have significantly reduced water infiltration and subsequently, seepage
- When fully operational, the eastern seepage recovery groundwater bores installed within the bedrock aquifer effectively draw down the water table creating an effective capture zone reducing groundwater migration offsite (refer Figure F6)
- Seepage occurs in areas south (southern seepage), southeast (eastern seepage) and southwest (western seepage) of Ash Dam B, with some potential limited seepage migrating beneath the collection trenches
- The water levels (and volume of ash) within Ash Dam B have a direct influence upon water levels in southern portions of the site, with artesian conditions observed in areas surrounding MW44 when dam levels are elevated, and reduced seepage observed when water levels are reduced

Groundwater within the Callide Creek alluvium typically flows east to west turning slightly northwest beyond Jambin-Dakenba Road (joining with alluvium along Kroombit Creek). The groundwater levels within the aquifer are generally observed to remain below ground level through the investigation area, indicating that the aquifer discharges at a lower elevation (outside the Callide Aquifer investigation area) and that groundwater flows down-valley towards this discharge point.

Monitoring of groundwater levels during the current period (October 2022 to December 2023) report groundwater levels are generally consistent with historical monitoring results, with the following exceptions:

- Monitoring wells ESC3, MW42 and MW43 report fluctuations in reported groundwater levels throughout the monitoring period, and/or compared to historical results. These wells are located within the seepage recovery area capture zone and the fluctuation in groundwater levels are likely to be associated with seepage recovery activities
- Monitoring wells MW69, MW70, MW72 and MW73, located downstream of the site adjacent to Callide Creek report reducing water levels through the monitoring period. It is likely that the reduction in water levels is associated with regional depletion of the Callide Creek alluvial aquifer following cessation of water releases from Callide Dam
- Some fluctuation is observed in monitoring wells MW79 and MW80, located within Callide Creek adjacent to the site. These wells are likely to be directly influenced by water levels/flow within Callide Creek adjacent to the site, with fluctuations associated with inflows from rainfall events
- Some variability is observed across the two monitoring events completed for new monitoring wells MW89, MW90 and MW91. These wells are located within the eastern seepage area capture zone, and variability may be associated with seepage recovery activities, however limited data is available for these locations

13.2 Quarterly Monitoring Analytical Results

Groundwater and surface water analytical results are presented in **Table T2** and **Table T3**, with a summary of results presented in **Table 38** (quarterly monitoring) and **Table 39** (event-based monitoring). Groundwater and

surface water monitoring was completed in accordance with the Addendum SAQP (Epic, 2023a) at locations detailed in **Table 8** (**Section 5.1**).

Table 38. Groundwater and Surface Water Monitoring Results Summary

Investigation Area	Monitoring Wells	Identified Risk/Target	Analytical Results
Northern Boundary	MW74 SW06 SW33 SW34 SW45 BS3-CWN BS3-CWE BS30-CW	Potential impacts from offsite sources. Background monitoring location to assess hydraulically upgradient groundwater entering the site and upgradient surface water entering the site and leaving the site via the WSDC	Surface water results for samples collected along the northern site boundary generally report PFAS concentrations comparable to historical monitoring events, with PFAS detected in all four watercourses entering the site along the northern site boundary. Results from the current investigation support previous findings that high concentrations of PFAS are entering the site via the watercourses along the northern site boundary, with PFAS concentrations observed to decrease as surface water travels along the northern and western stormwater diversion channels. Further discussion of surface water results is presented in **Table 29** (**Section 10.2**), with statistical analysis presented in **Table 30**. Groundwater monitoring results for MW74 report an increase in total PFAS concentrations. The increase is attributed to increases in PFHxS, PCA compounds (PFBA, PFPeA, PFHxA, PFHpA, PFOA and PFNA) and 6:2 FTS, with PFOS concentrations remaining stable across all monitoring events. Further discussion of groundwater and surface water interaction along the northern site boundary is presented in **Section 10.3**.
Eastern Seepage Area	ESC3 ESC4 MW31 MW32 MW33 MW42 MW43 MW81 MW82 MW83 MW84 MW85 MW89 MW90 MW91 MW94	Potential migration of impacts from Ash Dam B via seepage to the eastern seepage collection area and offsite.	Groundwater results for the eastern seepage area support the presence of two seepage pathways, one associated with the current seepage pathway and seepage recovery system (ESC3, ESC4, ESC5, ESC6, MW42, MW52, MW61, MW83 and MW85), and an additional longer pathway associated with fractured rock roughly following a flow path connecting MW84, MW32 and MW43. Further discussion on groundwater results from the Eastern Seepage Area are presented in **Table 23** (**Section 8.2**).

Investigation Area	Monitoring Wells	Identified Risk/Target	Analytical Results
Southern Seepage Area	MW09 MW78 MW86	Potential migration of impacts from Ash Dam B via seepage to the southern seepage collection area and offsite.	Groundwater results for the southern seepage area report PFAS concentrations comparable to historical monitoring events and support previous findings presented in the Initial CLID (Epic, 2022c). Monitoring well MW86, installed between the southern and western seepage areas was reported to be dry, supporting that there is likely to be minimal seepage between these known seepage areas.
Western Seepage Area	MW40 MW49 MW56 MW68 MW98 SW13	Potential migration of impacts from Ash Dam B via seepage to the western seepage collection area and offsite.	Groundwater results for the western seepage area report PFAS concentrations comparable to historical monitoring events and support previous findings presented in the EE CLID (Epic, 2022c). New groundwater monitoring well MW98, installed immediately east of MW49, reported the lowest PFAS concentrations within the western seepage area bores (total PFAS 0.106 to 0.163 µg/L), with concentrations of PFOS (0.040 to 0.0647 µg/L) and the sum of PFOS and PFHxS (0.094 to 0.150 µg/L) reported above the 99% Species Protection limit and Drinking Water Criteria respectively. Groundwater was not reported to be encountered during drilling (GHD, 2023 – refer **Section 14.1**), with development reporting a low recovery yield (~0.05 L/s) and aquifer testing reporting a low hydraulic conductivity (0.00036 – 0.00088 m/day), indicating that MW98 may represent the lateral extent of seepage associated with the western seepage area. Surface water at SW13, located within the western seepage trench, reported increases in PFAS concentrations during the February 2023 and December 2023 monitoring event, with concentrations of PFOS (0.281 µg/L and 0.148 µg/L respectively) reported above the 95% species protection limit above the historical maximum (0.103 µg/L, Jan22). Concentrations of the sum of PFOS and PFHxS (0.555 µg/L and 0.311 µg/L) and total PFAS (0.678 µg/L and 0.401 µg/L) were also reported above historical maximums of 0.258 µg/L (Jan22) and 0.342 µg/L respectively. As reported in the Initial CLID (Epic, 2022c), water collected within the western seepage trench and pond is extracted from the western seepage pond (at SW03) and pumped back into ADB

Investigation Area	Monitoring Wells	Identified Risk/Target	Analytical Results
Callide Creek	MW69 MW70 MW72 MW73 MW79 MW80 SW02 SW12 SW22 SW40 SW41	Offsite impacts and migration downstream	Groundwater results for monitoring wells along Callide Creek generally report PFAS concentrations comparable to historical monitoring events and support previous findings presented in the EE CLID (Epic, 2022c). The exception is MW80 which reported highest concentrations during March 2023, with the sum of PFOS and PFHxS (0.115 µg/L) reported above the Drinking Water Criteria and the historical maximum of 0.0269 µg/L (May 2021). Results were reported within the historical range in June 2023, but were elevated against the historical range in September 2023 (0.0551 µg/L) and December 2023 (0.0696 µg/L). Results for groundwater monitoring wells within the Callide Creek Alluvium indicate that concentrations of PFAS downstream of the site are generally stable overtime as shown on **Figure F12**, noting some variability in concentrations at some locations (i.e. MW73). Surface water at SW12 (adjacent to site) reported concentrations of PFAS above historical ranges during the current monitoring period. PFOS (0.0106 µg/L, Feb23 and 0.0181 µg/L, Dec23) was reported above the historical maximum of 0.0058 µg/L (Nov21), and the Sum of PFOS and PFHxS (0.0721 µg/L, Feb23 and 0.0775 µg/L, Dec23) was reported above the historical maximum of 0.0234 µg/L (Nov21). Surface water at SW40 (Jambin Dakenba Road) reported elevated concentrations of PFAS during the October 2022 monitoring event, consistent with the July 2022 results, with results reported within the historical range during the July 2023 monitoring event.
Callide Alluvium	L005-B01 L006-B05 L012-B01 L021-B01 RN13030692 RN13030697 RN13030126 RN13030698 RN13030112 RN13030127[†] RN13030715[†]	Offsite impacts and migration to hydraulically downgradient areas	
Callide Dam	SW20 SW36	Background monitoring location to assess PFAS impacts in Callide Dam along with potential impacts via Dunn Creek.	Surface water results from Callide Dam reported PFAS detections in October 2022 (SW36), February 2023 (SW20 and SW36), June 2023 (SW20 and SW36) and December 2023 (SW20), with detections including PFBS (SW20 and SW36), MeFOSAA and EtFOSSA (SW36) and 6:2 FTS (SW20). Previous detections of MEFOSAA and EtFOSSA have only been reported in MW74 (MeFOSAA only, northern boundary) on two occasions and PW1 (ADB impoundment) on one occasion.

Investigation Area	Monitoring Wells	Identified Risk/Target	Analytical Results
Callide A / Dunn Creek	MW96 MW97 SW17+ SW18+ SW42+ SW43 SW44 R2+	Potential migration of impacts from Callide A via surface water.	Surface water results for Callide A and Dunn Creek report PFAS concentrations comparable to historical monitoring events and support previous findings presented in the EE CLID (Epic, 2022c). Comparison of results for surface water at SW44 (NSP), R2 and groundwater at MW97 indicate that a potential linkage may exist between surface water and seepage, and surface water/seepage and groundwater, with further discussion presented in **Section 7.3**.
Onsite Water Bodies	DRD PW2	Existing surface water monitoring locations within ADB catchment area.	Surface water results for onsite water bodies including the DRD and ADB (PW2) report PFAS concentrations comparable to historical monitoring events and support previous findings presented in the EE CLID (Epic, 2022c). Concentrations of PFAS within ADB at PW2 reported PFAS concentrations within historical ranges, however three of the monitoring events (February, September and December 2023) reported concentrations of the sum of PFOS and PFHxS (0.0931 µg/L to 0.117 µg/L) above the Drinking Water Criteria, with only one previous monitoring event (0.0948 µg/L, April 2022) reporting concentrations above the Drinking Water Criteria

Notes: + Samples were collected as part of event based or ad hoc sampling events when water was present at the sampling location

Table 39. Event Based Sampling Events

Date	Approximate Rainfall	Monitoring Wells	Investigation Area	Analytical Results
1 December 2022	10.2 mm (30Nov22) 30.4 mm (29Nov22)	SW28 SW33 SW34 SW35 BS3 CW BS3 SWN	Northern and Western Stormwater (potential impacts from offsite sources)	• All samples reported concentrations of PFAS above the laboratory's LOR, with highest concentrations of total PFAS reported in BS3 CWN (2.030 µg/L) and SW34 (1.32 µg/L) along the northern site boundary. Concentrations of PFAS reduced along the stormwater channels, with SW35 and SW28 located in the southern portion of the site reporting highest concentrations during the period of total PFAS of 0.319 µg/L and 0.368 µg/L respectively. Samples SW34, BS3 CW and BS3 CWN (upstream) and SW35 and SW28 (downstream) reported detections of similar PFAS compounds, including PSA and PCA compounds plus 6:2 FTS. • All samples reported concentrations of PFOS above the 99% Species Protection limit, with BS3 CWN reporting concentrations (0.301 µg/L) above the 95% Species Protection limit.

Date	Approximate Rainfall	Monitoring Wells	Investigation Area	Analytical Results
				• Samples SW34, BS3 CW and BS3 CWN reported concentrations of the sum of PFOS and PFHxS (0.180 µg/L, 0.183 µg/L and 0.595 µg/L respectively) above the Drinking Water Criteria
		SW42 SW43 SW44 R2	Dunn Creek (potential migration from primary source areas and residual impacts (Callide A) and potential impacts from offsite sources)	• All samples reported concentrations of PFAS above the laboratory's LOR, with highest concentrations reported at R2 (total PFAS 0.120 µg/L). • All samples reported concentrations of PFOS above the 99% Species Protection limit.
5 January 2023	46.8 mm	SW28 SW33 SW34 SW35 BS3 CW	Northern and Western Stormwater (potential impacts from offsite sources)	• All samples reported concentrations of PFAS above the laboratory's LOR, with highest concentrations of total PFAS reported in SW34 (2.19 µg/L) along the northern site boundary. Concentrations of PFAS reduced along the stormwater channels, with SW35 and SW28 located in the southern portion of the site reporting concentrations of total PFAS of 0.134 µg/L and 0.156 µg/L respectively. • All samples reported concentrations of PFOS above the 99% Species Protection limit (noting raised LORs for SW33 and SW35), with SW34 and BS3 CW reporting concentrations above the 95% Species Protection limit. • SW34 and BS3 CW reported concentrations of the sum of PFOS and PFHxS (0.309 µg/L and 0.354 µg/L respectively) above the Drinking Water Criteria
		SW42 SW43 SW44 R2	Dunn Creek (potential migration from primary source areas and residual impacts (Callide A) and potential impacts from offsite sources)	• All samples reported concentrations of PFAS above the laboratory's LOR, with highest concentrations reported at R2 (total PFAS 0.0511 µg/L) and the NSP (SW44, total PFAS 0.0693 µg/L). • All samples reported concentrations of PFOS above the 99% Species Protection limit.

14 ADDITIONAL INVESTIGATIONS

As part of ongoing investigations completed at the site, a number of additional investigation scopes were completed to inform the nature and extent of PFAS, along with ongoing management of the site. Details on additional investigations are presented in **Table 40**, with further information presented in the sections below.

Table 40. Summary of Additional Investigation Scopes

Investigation Area/Target	Investigation Scope	Summary of Investigation Works
Seepage Areas (ADB)	Geophysical resistivity survey	Fender Geophysics completed a geophysical resistivity survey of current seepage areas and surrounding areas to map known and potentially unknown seepage pathways from the Callide B and C sites. The survey was completed using dipole-dipole electrical resistivity imaging (ERI) between 8 and 20 August 2022. Approximately 6700 m of resistivity lines were surveyed (Fender, 2022), on the western and southern sides of ADB and in off-site areas in the vicinity of bores MW43 and MW32. The survey identified a number of areas of potential water-bearing zones, which informed a groundwater bore drilling program to improve the level of understanding of seepage areas and PFAS distribution, and supplement the existing monitoring and recovery network. A summary of works completed in the eastern and western seepage areas is included in **Table 21** and **Table 24** respectively, with a copy of the geophysical resistivity survey report included as **Appendix N**.
	Groundwater Bore Drilling	Based on the findings of the geophysical survey, and in consultation with CS Energy's consultant hydrogeologist, a total of 11 groundwater bore sites (MW81 to MW86, MW89 to MW91, MW94 and MW98) were established by GHD to further investigate the eastern and western seepage areas and supplement the ongoing groundwater monitoring program. The scope of work completed included: • Drilling of 11 boreholes at the nominated locations • Soil sampling from each borehole, including collection of samples from the shallow sub-surface, the water bearing unit and a composite sample of drill cuttings • Conversion of 6 bores into groundwater monitoring wells • Conversion of 5 bores into groundwater recovery wells • Completion of aquifer testing of wells, including slug and pump testing of selected wells • Sampling of each well for PFAS Proposed bores MW87, MW88, MW92 and MW93 were unable to be drilled due to access constraints, noting that MW98 was installed as an alternate location to proposed MW93. Following installation, bores were sampled by GHD in August 2023, with bores sampled by Epic as part of the September and December 2023 quarterly monitoring events. Monitoring well MW86 was dry during sampling events and as such no samples were collected at this location. A summary of works completed in the eastern and western seepage areas are included in **Table 21** and **Table 24** respectively, with a copy of the geophysical resistivity survey report included as **Appendix N**. Further details are presented in **Section 14.1**.
	Interpretative hydrogeological review of additional seepage investigations	Environmental Management Strategies completed an interpretative hydrogeological review of groundwater results following completion of the geophysical resistivity survey and groundwater bore drilling scopes, which included updating the preliminary CSM associated with groundwater seepage from ADB. A summary of the EMS report is presented in **Section 14.1.1**.

Investigation Area/Target	Investigation Scope	Summary of Investigation Works
Eastern Diversion Channel (EDC)	Sediment sampling along the EDC	Sediment sampling was completed along the EDC to assess potential localised sources of PFAS which may be contributing to elevated PFAS reported in groundwater at MW84. The EDC diverts surface water from areas south of the FOT around the ADB spillway. Four sediment samples (EDC-SED-4 to EDC-SED-7) were collected along the length of the EDC. Further details are presented in **Section 14.3**.

14.1 Bore Drilling and Well Installation (GHD, 2023)

GHD were commissioned to undertake a targeted drilling and monitoring bore installation program to further characterise the potential source and extent of PFAS contamination at the site. Investigation findings are presented in the following reports, with copies of each report included in **Appendix O**:

- GHD (2023a), Factual Bore Completion Report, Callide Groundwater Bore Drilling Project, 6 October 2023
- GHD (2023b), Soil Sampling Report, Callide Groundwater Bore Drilling Project, 6 October 2023
- GHD (2023c), Groundwater Sampling Report, Callide Groundwater Bore Drilling Project, 6 October 2023

A summary of the key findings of the reports is provided in **Table 41**.

Table 41. Document Review: GHD Bore Drilling and Well Installation (GHD, 2023a, b & c)

Document Titles	• Factual Bore Completion Report, Callide Groundwater Bore Drilling Project, 6 October 2023 (GHD, 2023a) • Soil Sampling Report, Callide Groundwater Bore Drilling Project, 6 October 2023 (GHD, 2023b) • Groundwater Sampling Report, Callide Groundwater Bore Drilling Project, 6 October 2023 (GHD, 2023c)
Prepared By	GHD
Prepared For	CS Energy
Investigation Site/Area	Callide Power Station and surrounds (Cocups Road road corridor)
Date	6 October 2023
Objectives	
Implement a targeted drilling and bore installation program prepared by CS Energy (the Callide Groundwater Bore Drilling Project) to fulfill the requirements of the Amended EE and to further characterise the potential source and extent of PFAS contamination likely to be caused from the storage and use of AFFF at the site.	
Scope	
• Drilling and installation of five recovery bores • Drilling and installation of six monitoring bores • Development of all 11 newly installed bores • Conducting pumping tests on five newly installed recovery bores and slug testing of five monitoring bores (one was dry) • Groundwater sampling and analysis of five new recovery bores, five new monitoring bores, and one existing monitoring bore. One new monitoring bore was not sampled as it was dry • Survey of newly installed wells • Soil and drill cuttings sampling and analysis. • Reporting	
Findings	
Bore Construction: Bores were drilled using air rotary techniques up to depths of 40 m. Recovery bores were drilled at a diameter of 205 mm and installed with 150 mm nominal diameter Class 9 µPVC casing and 6 m of screens whilst monitoring bores were fitted with 50 mm nominal diameter Class 18 µPVC casing and screens. Details on the bore construction is presented in **Table 42**. Bore locations are shown on **Figure F2**. A copy of GHD bore logs are included in **Appendix I** for reference.	

Table 42. Summary of Recovery and Monitoring Bores (GHD, 2023a)

Location area	Bore ID	Bore type	Screened aquifer unit	GDA94 MGA Zone 56		Natural surface elevation (m AHD)	Elevation of top of casing (m AHD)	Drilled depth (m BGL)	Screen interval (m BGL)	Date installed
				Easting	Northing					
Lower Ring Road	MW81	Recovery	Breccia / Tuff	258295.466	7304124.687	209.707	210.192	25.0	16.0 – 22.0	12/07/2023
Lower Ring Road	MW82	Recovery	Andesite	258241.432	7304075.328	208.495	209.023	25.0	18.0 – 24.0	13/07/2023
Lower Ring Road	MW83	Recovery	Andesite	257998.064	7303887.720	197.698	198.210	37.0	17.0 – 23.0	14/07/2023
Fire track	MW84	Monitoring	Andesite	258370.406	7304141.737	212.598	213.278	40.0	12.0 – 18.0	11/07/2023
Fire track	MW85	Recovery	Andesite	258045.167	7303790.073	196.261	196.984	40.0	9.5 – 15.5	19/07/2023
Fire track	MW86	Monitoring	Andesite	257074.299	7303520.495	197.514	198.203	37.0	9.0 – 15.0	18/07/2023
Offsite	MW89	Monitoring	Shale	258023.937	7303642.861	191.542	192.203	12.5	5.0 – 11.0	21/07/2023
Offsite	MW90	Recovery	Shale	258012.324	7303617.432	190.482	191.097	31.0	21.0 – 27.0	27/07/2023
Offsite	MW91	Monitoring	Andesite	258097.269	7303613.698	193.046	193.772	30.0	12.1 – 18.1	26/07/2023
Fire track	MW94	Monitoring	Andesite / Tuff / Shale	257792.558	7303623.283	193.811	194.311	25.0	19.0 – 25.0	15/07/2023
Fire track	MW98	Monitoring	Shale	256822.495	7303493.653	189.422	190.004	31.0	12.0 – 18.0	18/07/2023

Table notes:
Easting, Northing and elevations listed are from survey completed by Fredriksen, Maclean and Associates.
AHD – Australian Height Datum
BGL – Below ground level
GDA – Geodetic Datum of Australia
MGA – Map Grid of Australia

Water-bearing strata were present in andesite and andesitic breccia and tuff, with some bores (i.e. MW84) including sections logged as shale (this strata possibly comprises decomposed andesite as reported by EMS, 2024). All bores except MW89, reported groundwater to be under pressure (semi-confined) with the standing water level higher than the water intersection depth.

Aquifer Testing:
Slug testing (**Table 43**) and pump tests (**Table 44**) were completed on monitoring wells and recovery bores respectively, with results presented below.

Table 43. Summary of Slug Test Results (GHD, 2023a)

Bore ID	Screened geology	SWL (m bTOC)	Test type	Test No.	Maximum displacement (m)	Hydraulic conductivity (K) m/d	Analytical solution
MW84	Andesite	6.32	Falling head test	Test 1	0.7	2.6	Bouwer-Rice
			Rising head test	Test 1	1.1	3.6	Bouwer-Rice
			Falling head test	Test 2	0.8	3.7	Bouwer-Rice
			Rising head test	Test 2	1.3	3.6	Bouwer-Rice
MW89[1]	Shale	7.52	Rising head test	Test 1	0.5	0.2	Bouwer-Rice
MW91	Andesite	9.97	Falling head test	Test 1	0.45	7.7	Springer-Gelhar
			Rising head test	Test 1	0.7	7.7	Springer-Gelhar
MW94	Andesite / Tuff / Shale	9.53	Falling head test	Test 1	0.45	8.7	Bouwer-Rice
			Rising head test	Test 1	0.5	8.7	Bouwer-Rice
			Falling head test	Test 2	1.0	8.8	Bouwer-Rice
			Rising head test	Test 2	1.3	8.7	Bouwer-Rice
MW98[2]	Shale	9.45	Falling head test	Test 1	0.7	0.00046	Bouwer-Rice
			Falling head test	Test 2	0.6	0.00088	Bouwer-Rice
			Rising head test	Test 2	0.6	0.00036	Bouwer-Rice

Table notes:
1. Only the rising head test was analysed, as the screen was partially saturated.
2. Construction of the bore has the filter pack extending above the saturated zone, therefore the initial slug test data points show the response to the filter pack, which has been disregarded. The line has been fitted along the long-term recovery rather than the initial displacement response.

Table 44. Summary of Pumping Test Results (GHD, 2023a)

Bore ID	Test Type	Date start	Duration (min)	Flow rate (L/s)	Bores monitored	Radial distance[1] (m)	Drawdown (m)
MW81	Step	3/8/2023	60	0.6, 1.0, 1.5, 2.0	MW81	0.0	Three steps completed. 7.5 m drawdown in fourth flow rate step.
	Constant	4/8/2023	470	1.6	MW81	0.0	6.0
					MW82	73.2	No obvious drawdown
					MW84	76.9	No obvious drawdown
MW82	Step	5/8/2023	120	1.0, 1.5, 2.0, 2.5	MW82	0.0	Four flow rate steps completed for around 8.5 m drawdown.
	Constant	7/8/2023	600	2.4	MW82	0.0	8.4
					MW84	145.1	No obvious drawdown
MW83	Step	1/8/2023	120	0.2, 0.3	MW83	0.0	Drawdowns had yet to stabilise in the second flow rate step.
		3/8/2023	205	0.1, 0.2 and 0.3	MW83	0.0	Drawdowns had yet to stabilise in the third flow rate step.
	Constant	2/8/2023	215	1.5	MW83	0.0	7.6
					ESC1	55	No obvious drawdown
					MW85	108.4	Recovery response
MW85	Constant	8/8/2023	18	0.1	MW85	0.0	*Short duration
					ESC1	127.4	No obvious drawdown
					MW51	72.5	No obvious drawdown
					MW29	126.8	No obvious drawdown
					MW83	108.4	No obvious drawdown
MW90	Step	8/8/2023	55	0.2	MW90	0.0	Refer discussion below.
	Constant	10/8/2023	540	0.21 (300)[2] 0.3 (240)	MW90	0.0	4.0
					MW89	28	No obvious drawdown
					MW43	45	No obvious drawdown
					MW91	85	No obvious drawdown

Table note:
1. Radial distance from pumping bore.
2. Values in parenthesis represent duration of flow rate (min).

Soil Sampling:
Soil samples were collected from each bore at the following target depths/intervals:

- Shallow subsurface (between 0.1 m and 0.5 m)
- Deeper subsurface (between 0.35 m and 0.55 m)
- Water bearing unit (composite)
- Drill cuttings (composite)

All samples reported concentrations of PFAS below the laboratory's LOR and/or below the adopted assessment criteria (HIL-D and ecological direct and indirect exposure), with a summary of analytical results as follows:

- PFAS was reported in four of the 19 shallow and deeper subsurface samples, with total PFAS concentrations ranging from 0.0006 mg/kg to 0.0071 mg/kg. Samples reported detections of PFBS, PFHxS, PFOS, PFPeA and PFHxA. TOPA results for the same samples reported total PFAS concentrations ranging from 0.0003 mg/kg to 0.0095 mg/kg
- PFAS was reported in one of the 11 drill cutting composite samples (MW84_DC_0.0-39.0), with a total PFAS concentration of 0.011 mg/kg and detections of PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFHxA, PFOA. TOPA results for the same sample reported a total PFAS concentration of 0.0096 mg/kg

Groundwater Sampling:
Groundwater sampling was completed on new monitoring and recovery bores, with results discussed in **Section 8**, **Section 9** and **Section 13**. Groundwater results are presented in **Table T2**.

Limitations
All three reports (GHD, 2023a, b & c) comprise factual reports in line with the relevant scope, with the following report limitations noted: • The reports have been prepared by GHD Pty Ltd (GHD) for CS Energy Limited (CSE) for the purpose of responding to a notice to conduct an environmental evaluation issued by the administering authority pursuant to section 326B of the Environmental Protection Act 1994 (Qld) (EP Act) (the Purpose), and not for any other purpose. The report may be used by Queensland Department of Environment and Science (DES), acting in its capacity as the administering authority (as defined in the EP Act)), and the appointed contaminated land auditor, and Luke Amies (Suitably Qualified Person) for the Purpose. • GHD has prepared this report on the basis of information provided by CSE and others who provided information to GHD (including Government authorities and analytical laboratories), which GHD has not independently verified or checked beyond the agreed scope of work. Where drill hole logs, laboratory tests and similar work have been performed and recorded by others the data is included and used in the form provided by others

14.1.1 Data Reliability and Review

Complete reports were provided to Epic for review, noting that consultant report limitations permit the use of reports for responding to the EE. Review of provided reports indicate that drilling and well installation, collection of soil and groundwater samples and aquifer testing were undertaken by appropriately trained field personnel in accordance with relevant guidelines and utilising calibrated field equipment and appropriate field QA/QC methods (as applicable). Analytical samples were analysed by laboratories accredited by the National Association of Testing Authorities employing appropriate analytical techniques.

It is noted that the installation, development and aquifer testing of groundwater monitoring and recovery bores was completed under the supervision of CS Energy's consultant hydrogeologist who confirmed well construction details based on the current hydrogeological/geological understanding of the site and conceptual understanding of seepage pathways. All groundwater monitoring and recovery bores were installed by licenced drillers in accordance with the Minimum Construction Requirements for Water Bores in Australia (4th edition) (refer bore installation report included in Appendix O) as required by EE Requirement 7(g).

On this basis, results of sampling undertaken at the site by GHD are considered suitable for interpretative use, with groundwater monitoring infrastructure considered suitable for ongoing monitoring of groundwater conditions at the site. It should be noted that review of the GHD report has identified the following limitations and considerations:

- GHD only completed one round of groundwater sampling in August 2023, with sampling limited to newly installed groundwater monitoring and recovery bores.
- Sampling methods adopted are generally comparable to methods completed as part of EE investigations, noting the following:
    - Groundwater monitoring wells were sampled using low-flow techniques following installation and development using a QED Sample Pro bladder pump with single use HDPE bladders and tubing.
    - Groundwater recovery bores were sampled during completion of aquifer pump testing using a submersible Grundfos pump.
    - Decontamination of sample pumps was completed between each location, with rinsate samples collected reporting PFAS concentrations below the laboratory's LOR.
- Groundwater samples reported raised LORs for a number of PFAS compounds due to matrix interference or the presence of high contaminant levels (i.e. MW84), noting PFOS was reported above the LOR in all samples.
- Soil samples included the collection of composite 'chip' samples from the full length of drill cuttings returned to the surface during rotary air drilling. A subsample from each 1.0 m depth interval was mixed in a stainless steel bowl to form the composite sample. It is noted that chip sampling was completed to inform waste disposal requirements, with limitations in the interpretation of chip samples existing due to the likely heterogeneity of the material forming the composite sample (i.e. varying quantities of different rock materials and sizes/amounts of cuttings). Shallow and deeper sub-surface samples were collected via

hand auger. The hand auger is reported to have been decontaminated between each sampling location, with rinsate samples collected reporting PFAS concentrations below the laboratory's LOR.

14.2 Interpretative Hydrogeological Review (EMS, 2024)

Environmental Management Strategies (EMS) was commissioned to undertake a review of results from the additional bore drilling and well installation program (refer **Section 14.1**) and ongoing groundwater monitoring (refer **Section 13**) and update the preliminary CSM associated with groundwater seepage from ADB (EMS, 2022). A summary of the report findings is provided in **Table 45**.

Table 45. Document Review – Callide P.S. PFAS Environmental Evaluation, Groundwater Investigation, January 2024 (EMS, 2024)

Document Title	Callide P.S. PFAS Environmental Evaluation, Groundwater Investigation, Callide PS, January 2024
Prepared By	Environmental Management Strategies
Prepared For	CS Energy
Investigation Site/Area	Callide Power Station
Date	February 2024
Objectives	
To present the interpretation and findings of PFAS groundwater investigations and associated sampling undertaken between June and August 2023 in the Eastern and Western Seepage areas of Callide Power Station and update the preliminary CSM associated with groundwater seepage from ADB (EMS, 2022).	
Findings	

A summary of key findings reported include:
 	
Eastern Seepage Area:
• Two specific zones of PFAS presence have been identified in groundwater at the eastern end of the ADB:
  • An inner (possibly older) more extensive zone with PFAS concentrations generally in the range 0.05 to 0.5 µg/L which is inferred to be sourced from ADB seepage, and
  • A more easterly higher concentration PFAS zone on the MW84-MW32-MW43 axis – inferred to be potentially sourced from the FOT or an unknown localised source.
• The elevated PFAS levels recorded at MW84 could be a result of:
  • surface drainage of PFAS from AFFF usage areas to ADB and subsequent seepage migration via fractured rock pathways in the spillway area in periodic pulses to the MW84 area;
  • long flowpath dissolved flow groundwater migration of PFAS in fractured rock from the Fuel Oil Tanks area to the ADB spillway area. This is discussed further below; or
  • the presence of a distinct PFAS source area at the ADB spillway area from possible local area usage of AFFF and infiltration to depth of dissolved PFAS;
• The PFAS plume on the MW84 – MW32 – MW43 flow path is continuing to migrate past MW43 but the main body of the PFAS plume does not appear to have reached Callide Creek.
  • This is supported by the mostly low levels of PFAS measured at sampling site SW12 in Callide Creek below the Callide Dam spillway and at alluvial bore MW80 at the Callide Creek Crossing.
  • Measurable levels of PFAS (above 0.03 µg/L) have and are expected to continue to be observed at sampling site SW12 during dry/low inflow periods of surface water/rainwater.
• PFAS travel times from MW32 to MW43, and MW43 to Callide Creek along the inferred seepage flowline as unattenuated solutes are estimated at 4.5 and 6.3 years respectively.
• Hydraulic testing of bores MW84 and MW91 suggest that those sites are suitable for installation of recovery bore infrastructure.
• Based on the test pumping data and the analysis undertaken by GHD, bores MW81 and MW82 are in suitable locations and would appear to have sufficient hydraulic capacity to produce 1 to 2.5 L/s, when ADB seepage is occurring.
• MW90 yielded 0.3 L/s on test pumping and is considered suitable for equipping as a low yield recovery bore, with operation similar to the existing low yield bores in the WSCP and Southern Seepage area.	

- Groundwater level data and PFAS concentrations from various monitoring bores in the Eastern Seepage Recovery Area support the inference of a groundwater capture zone which potentially includes bores ESC3, MW42, MW43, MW51, MW63 and MW65 (**Figure 29**)

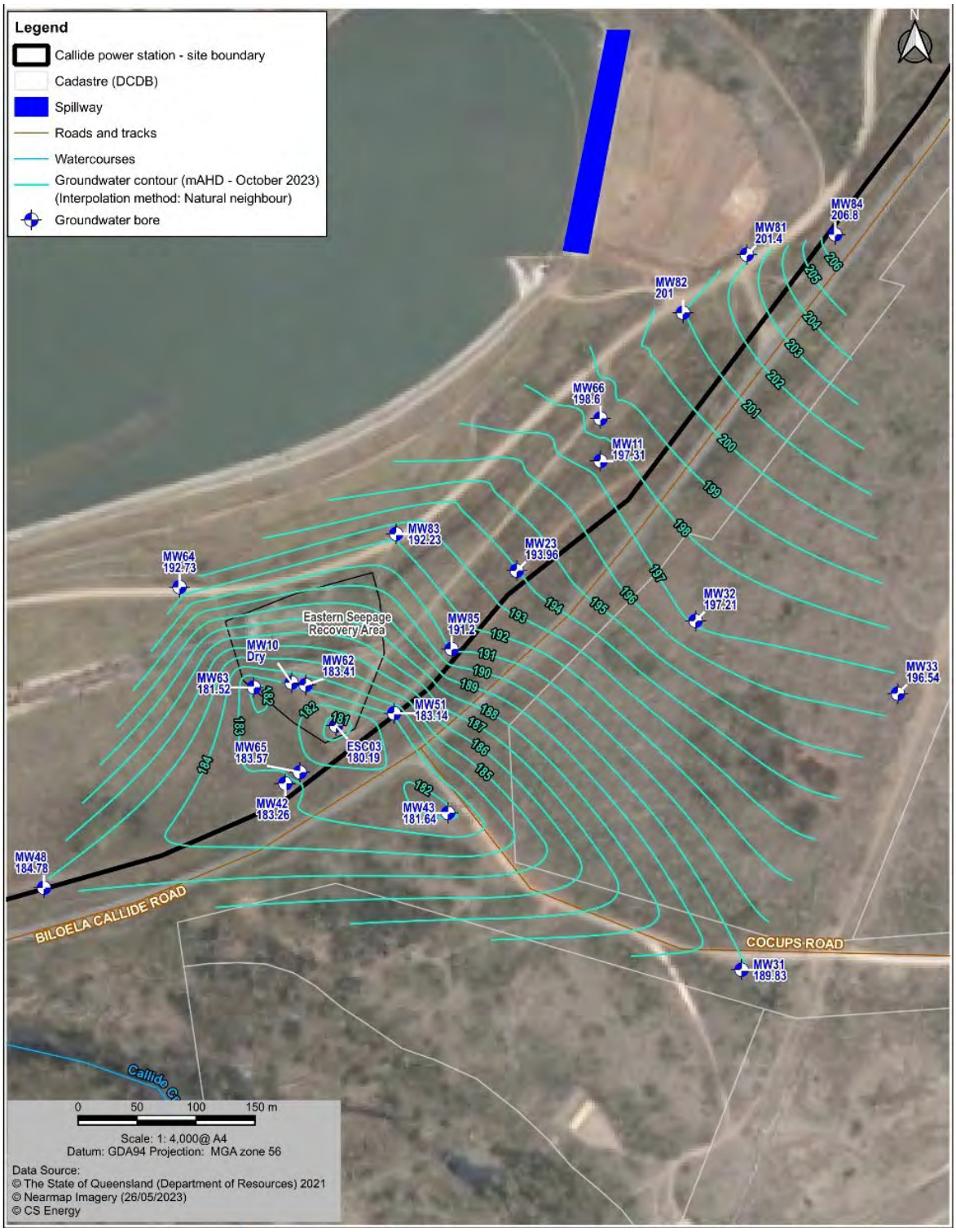


Figure 29. Eastern Seepage Area Groundwater Contours (October 2023) (EMS, 2024)

Western Seepage Area:

- MW86 was drilled on a geophysical target identified on the southern boundary. This bore was dry, which supports the premise that there is little seepage to Callide Creek from ADB between the Southern and Western Seepage Recovery Areas.
- Groundwater level data from various monitoring bores in the Western Seepage Recovery Area and PFAS data from bore MW68 indicates that groundwater flux continues to migrate off-site in the Western Seepage Recovery Area, in a southerly direction (**Figure 30**)



Figure 30. Western Seepage Area Groundwater Contours (August 2023) (EMS, 2024)

Groundwater Seepage:
Estimates of the flux of groundwater, groundwater recovery and residual (fugitive) seepage are summarised in **Table 46**.

Table 46. ADB Groundwater Flux and Recovery (EMS,2024)

Area	Groundwater Flux Estimate (m^3/week)	Groundwater Recovery Estimate (m^3/week)	Residual Seepage (m^3/week)	Percent Recovery
Eastern and Southern Seepage Areas	4,890	3,680	890[2] to 1,210[1]	75 to 80%
Other Southern ADB Fractured Rock	126	0	126	0%
Total Eastern and Southern Seepage	5,016	3,680	1,016 to 1,336	73 to 80%
Western Side of ADB[3]	721	539	182	75%
Total Seepage	**5,737**	**4,219**	**1,198 to 1,518**	**73 to 80%**

Notes: [1] Based on Darcy Equation
[2] Method of difference from mass balance
[3] Includes site western boundary

Recommendations

Based on the review of results from the additional bore drilling and well installation program undertaken by GHD, EMS made the following recommendations:

- Undertake further investigatory drilling to confirm whether or not the FOT area is the potential source area for PFAS at MW84 adjacent to the ADB spillway, and drilling in the ADB spillway area to improve the understanding of groundwater flow and solute transport in that area.
- Install seepage recovery equipment at bores MW81, MW82 and MW90.
- Install additional recovery bores in vicinity of MW84 and MW91.
- Test pumping of bore MW78 on the southern boundary and assess suitability as recovery bore. Install seepage recovery equipment at MW78 if it is suitable as a recovery bore.
- Install an additional monitoring bore at Western Seepage Recovery Area.
- Trial seepage recovery from bore MW49.
- Additional low yield recovery bore(s) on southern boundary Western Seepage Recovery Area.
- Additional monitoring bores on the site's western boundary.

Limitations

The following report limitations are noted (EMS, 2024):

- EMS has relied upon third party reports, data, observations, estimates, interpretations and publicly available information for the compilation of this report.
- This report does not encompass verification of the efficacy of data provided by third parties, or in particular, an audit of sampling or laboratory analytical procedures or protocols
- This report has not been prepared for use of parties other than the client, the owner and their respective consulting advisers and DES. It may not contain sufficient information, nor should it be relied upon, for the purposes of other parties or for other uses.
- To the best of our knowledge, information contained in this report is accurate at the date data was originally reported. However, conditions including climate, site activities, regional development and water usage and surface and groundwater quality can change, limiting use of the report over time.

14.3 Eastern Diversion Channel (EDC)

Sampling of sediments along the EDC was completed in accordance with sediment sampling methods detailed in the EE SAQP (Epic, 2022a) and included the collection of four samples (EDC-SED-4 to EDC-SED-7) of sediments accumulated within the channel. Samples were collected by hand, using a nitrile glove.

Sampling locations are shown on **Figure F6**, with a summary of analytical results presented in **Table 47**. Analytical results are presented in **Table T4** (sediment) and **Table T6** (leachate), with laboratory documentation provided in **Appendix K**.

Table 47. Eastern Diversion Channel Results Summary

Investigation Area/Target	Observations	Analytical Results
Potential PFAS impacts along the EDC	The majority of the EDC was dry at the time of sampling, with sediments comprising dry, brown gravelly sand with small to medium gravels. A small (~3 m) section of the EDC was observed to be moist to wet, and comprised a brown gravelly sandy clay with small gravels. Sample EDS-SED-6 was collected from this section.	**PFAS Results** • PFAS was detected in samples EDC-SED-4, EDC-SED-5 and EDC-SED-6, with highest concentrations reported in EDC-SED-6, located in the centre of the EDC. No PFAS was detected in the most upstream location (EDC-SED-7) • Samples EDC-SED-4 and EDC-SED-5 reported detections of PFOS, PFHxS and PFOA, with results reported below the respective soil investigation criteria • Sample EDC-SED-6 reported detections of PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFBA, PFPeA, PFHxA, PFHpA and PFOA, with concentrations of PFOS (0.230 mg/kg) reported above the ecological indirect exposure criteria of 0.01 mg/kg and the Sum of PFOS and PFHxS (0.295 mg/kg) reported above the HIL-A criteria of 0.01 mg/kg, but below the HIL-D criteria. **TOPA Analytical Results** TOPA analysis completed on sample EDC-SED-6 reported concentrations of PFAS generally comparable to the standard analysis results, with an overall reduction (-33%) in PFAS concentrations following oxidation, indicating that additional precursors are unlikely to be present. **TOF Analytical Results** TOF analysis completed on sample EDC-SED-6 reported concentrations below the laboratory's LOR of 1.0 mg/kg indicating additional fluorinated organic compounds are unlikely to be present. **ASLP Leachability Results** Australian Standard Leaching Protocol (ASLP) leachability analysis performed on EDC-SED-6 reported leachable concentrations of PFAS compounds detected in the standard analysis (PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFBA, PFPeA, PFHxA, PFHpA and PFOA). Leachable concentrations of PFOS (3.99 µg/L) were reported above the 95% Species Protection limit of 0.13 µg/L, with concentrations of the sum of PFOS and PFHxS (5.87 µg/L) reported above the Recreational Water criteria of 2.0 µg/L. Sample EDC-SED-6 reported a total PFAS leachate concentration of 6.98 µg/L.

14.3.1 Eastern Diversion Channel Discussion

Sediment results collected from the EDC reported elevated concentrations at the location of sample EDC-SED-6, which was collected from an area of moist to wet sediment within the alignment of the EDC. Concentrations of PFAS were also reported to be highly leachable, with leachability of PFOS and the sum of PFOS and PFHxS reported above the 99% and 95% Species Protection limits and the Drinking and Recreational Water Criteria respectively.

The nearest known PFAS source area is the FOT, located approximately 700 m north, with elevated PFAS compounds also reported in MW84, located approximately 225 m to the southeast. It's noted that the location of EDC-SED-6 is in close proximity to the location of the inferred geological fault line, with MW84 (southeast) and the FOT (north) also located near the inferred lineament (refer **Figure F6**).

It is noted that perfluoroalkyl sulfonic acid (PSA) compounds comprised the main functional group (~90%), with PFOS (~60%) the main compound by percent composition. Review of compositional data indicates similarities in the PFAS composition in sediment at EDC-SED-6 and soils at the FOT (refer Figure 45 in the Initial CLID (Epic, 2022c)) which reported PSA compounds as the main functional group (generally >80% by composition). Comparison with groundwater results from MW84 indicates a similar trend, with PSA compounds as the main functional group (>70%), however, PFOS was only reported to comprise approximately 20 to 30%. In addition, results from EDC-SED-6 with MW84 both report detection of the same PFAS compounds (PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFBA, PFPeA, PFHxA, PFHpA and PFOA).

15 REVISED CONCEPTUAL SITE MODEL

Following completion of the site investigation, a review of the CSM presented as part of the Initial CLID (Epic, 2022c) has been completed, with a summary of updated/revised CSM aspects discussed below. Further details on the CSM are included in the Initial CLID (Epic, 2022c), with CSM figures (updated where applicable based on the findings of this report) included in **Appendix E.**

Table 48. Revised CSM Aspects

CSM Aspect	Discussion/Comment
Groundwater	Results from surface water investigations have identified the following source-pathway linkages: • Groundwater results for background monitoring wells located along the northern (hydraulically upgradient) boundary indicate that groundwater located along the northern site boundary (as represented by MW01 and MW74) is likely to have been impacted from surface water entering the northern site boundary from the area of the mine and subsequently migrating to the underlying aquifer. Elevated concentrations of PFAS were reported in SW33, SW34, BS3 CW, BS3 CWN and SW45. An increasing trend in PFAS concentrations is observed in MW74. It is noted that based on the topography of areas north of the site, groundwater impacts may be localised to areas along the northern site boundary where surface water pools following flow events, with features including the railway line providing a constriction to surface water flows. • Groundwater results for the eastern seepage area support the presence of two seepage pathways, one associated with the current seepage pathway and seepage recovery system (ESC3, ESC4, ESC5, ESC6, MW42, MW52, MW61, MW83 and MW85), and an additional longer pathway associated with fractured rock roughly following a flow path connecting MW84, MW32 and MW43. • High concentrations of PFAS were reported in new groundwater monitoring well MW84, however it's not considered to change the current understanding of potential risk associated with the eastern seepage area, with results from existing monitoring wells MW32 and MW43 remaining stable over time, and PFAS concentrations reducing from north to south along the inferred MW84-MW32-MW43 seepage pathway. Southern portions of the inferred MW84-MW32-MW43 seepage pathway are located within the existing eastern seepage area recovery zone which is likely capturing some seepage from this pathway (as supported by water levels and variability in PFAS concentrations). • The nearest known PFAS source area to MW84 (with high PFAS concentrations) is the FOT, located approximately 900 m north. It's noted that MW84 and MW32 are located in close proximity to the location of an inferred geological fault line, which is inferred to continue to the north, with sediment in the eastern diversion channel, also located in proximity to the inferred geological fault line and approximately 225 m northwest of MW84, also reporting high concentrations of PFAS. • Fugitive seepage from the combined eastern/southern and western seepage areas is 145 - 190 m^3/day and from the western side of ADB 26 m^3/day (EMS, 2024), with >70% of seepage estimated to be recovered. • Groundwater results from the western seepage area reported comparable PFAS composition across all monitoring wells, with MW49 reporting a greater proportion of PFHxS and highest concentrations (approximately one order of magnitude higher than other wells). It is likely that surface water within the western stormwater diversion channel infiltrates through shallow alluvial soils in the southern portion of the site near MW55 and continuing to the site boundary. Current results indicate the elevated concentrations of PFAS measured in MW49 are unlikely to be caused by this infiltration. MW49 appears to be located outside of the current groundwater seepage capture area. New monitoring well MW98, located approximately 14 m east of MW49, may represent the lateral extent of seepage associated with the western seepage area. • Concentration of PFAS within the Callide Creek alluvium is reported to be variable, but present throughout the offsite investigation area, with PSAs

CSM Aspect	Discussion/Comment
	(including PFOS and PFHxS) comprising the dominant PFAS group. Detections of PCA and FSA compounds were generally limited to areas upstream of the Dawson Highway (closer to the site). In general, PFAS concentrations decrease with distance from the site, with the composition of PFAS also observed to change with distance from site (higher proportion of PFOS adjacent to the site, with PFHxS becoming the main compound approximately 5 km downstream). The results support the current CSM that the variability in PFAS concentrations is associated with a number of mechanisms including the variability of current and historical releases, variability of aquifer composition, surface water inflows from contaminated and uncontaminated areas, and recharging of the aquifer by surface water and releases from Callide Dam which are likely to dilute PFAS within central areas of the alluvium (along the alignment of Callide Creek).
Surface Water	Results from surface water investigations have identified the following source-pathway linkages: • PFAS is reported to be entering the site along the northern site boundary (via four main watercourses represented by SW33, SW34, BS3 CWE and BS3 CWN), with concentrations exceeding the 99% species protection limit (all samples) and the 95% species protection limit (PFOS, 0.13 µg/L) and the drinking water criteria (sum of PFOS and PFHxS, 0.07 µg/L) in SW34 and BS3 CWN. • Once surface water has entered the site it is observed to flow along the NSDC and WSDC and discharge to Callide Creek via SW28. Concentrations of PFAS at the point of discharge (SW28) from the WSDC are considerably lower than those at the northern site boundary, with concentrations of PFOS exceeding the 99% species protection limit. Sediment sampling along the Northern Stormwater Diversion Channel (NSDC) (refer below) indicate approximately 1.0 – 1.5 km of sediments within the NSDC, commencing at SW34 and continuing to between NSDC2 (1.0 km downstream from SW34) and NSDC3 (1.5 km downstream from SW34) has been impacted by PFAS contaminated surface water entering the site along the northern site boundary. • Concentrations of PFAS within the Western Seepage Collection Trench were observed to increase between Notch-V1 (top of seepage trench) and the western seepage collection pond (SW03) supporting the knowledge that the trench is intersecting shallow seepage from under the wall of ADB. The composition of PFAS within the trench was comparable to adjacent surface water bodies (i.e. Notch-V1 and the borrow pits and Notch-V2 and the western impoundment of ADB). Variability and high concentrations reported at SW03 are likely to be associated with inputs from the seepage trench (comprising seepage and rainwater) and recovered groundwater (from MW55, MW56, MW57 and MW58) pumped to the western seepage collection pond. • Surface water within the DRD, ADB impoundments and borrow pits are generally comparable in concentration and composition, noting some variance across monitoring events. Concentrations of PFAS in the borrow pits were observed to be higher, however no evidence of a separate source is observed, with lower concentrations reported in MW77 (adjacent to the borrow pits, hydraulically upgradient), and no PFAS reported in the ash filled evaporation ponds (dewatered) upgradient of the borrow pits. Monitoring results for water impounded within ADB (as represented by PW2) indicate concentrations may be increasing. • At Callide A, PFAS is reported to be present in Dunn Creek, with results indicating that a potential linkage may exist between surface water in the NSP (SW44) and seepage (represented by R2), and surface water/seepage and groundwater (represented by MW97). Detections of PFAS have also been reported at the mouth of Dunn Creek (SW36) during two monitoring events. Concentrations reported within Dunn Creek are likely to be associated with discharges from Callide A (via release point R2 and/or groundwater as represented by MW97) combined with upstream sources from the mine, noting limited water is released via R2, and during 2023 CS Energy pumped out the R2 sump to prevent releases via this pathway. Historically PFAS concentrations (SW18) have been higher

CSM Aspect	Discussion/Comment
	upstream of the site, noting that a mine dam (Dunn Creek Dam) is located adjacent to the north-eastern corner of the site. A localised PFAS impact is reported within accumulated sediments in the NSP, with PFAS reported in surface water (SW44), seepage (R2) and groundwater (MW97) likely associated with this localised impact.
Sediment	• Results from sediment investigation along the Northern Stormwater Diversion Channel (refer Epic, 2022c) indicate approximately 1.0 – 1.5 km of sediments within the NSDC, commencing at SW34 and continuing to between NSDC2 (1.0 km) and NSDC3 (1.5 km) has been impacted by PFAS contaminated surface water entering the site along the northern site boundary. Surface water monitoring (refer above) indicates impacted surface water flow along the NSDC and WSDC and discharge to Callide Creek via SW28, with lower concentrations observed at the point of discharge. High concentrations of PFAS have been reported coming onto site on the northern boundary in an adjacent watercourse represented by samples BS3 CWN and BS3 CW, with accumulated sediments along this pathway also likely to contain elevated PFAS concentrations (based on sampling completed along the NSDC). • Further investigation at Ash Dam 4 indicates that a localised source of PFAS (as represented by borehole AD01) is likely contributing to PFAS concentrations reported in sediments in the drainage line at Ash Dam 4 • Sediment sampling within the eastern diversion channel, located adjacent to the ADB spillway reported high concentrations of PFAS in one sample (EDC-SED-6), with PFAS concentrations also reported to be highly leachable. The nearest known PFAS source area is the FOT, located approximately 700 m north, with elevated PFAS compounds also reported in MW84, located approximately 225 m to the southeast. It's noted that the location of EDC-SED-6 is in close proximity to the location of the inferred geological fault line, with MW84 (southeast) and the FOT (north) also located along the inferred lineament.
Soils	Soil investigations completed as part of the EE CLID (Epic, 2022c) confirmed the FOT and FTG as primary PFAS source areas, associated with the historical use of AFFF at both locations. Remediation of the FOT and FTG has resulted in the stabilisation of approximately 1.3 kg of PFAS, with stabilised material reporting a reduction in the leachability of PFAS of >99.7%. A further approximately 0.1 kg of PFAS has been removed from the site in concrete material formerly forming the FTG bund. Residual soil impacts remain at both the FOT and FTG outside of the remediation areas, and will require ongoing management as part of site operations. The nature of the remediation should, however, slow any mobilisation of contaminants from these areas. Secondary source areas and residual impacts have been reported at the following areas: • The fire station is considered to be a secondary source area (refer Epic, 2022c). PFAS was detected in all samples, with concentrations reported below the adopted assessment criteria. Several PFAS compounds were detected which is likely to be associated with the different foam products historically utilised at the site. PFAS reported at the fire station is considered to be associated with residual impacts of cleaning and drying of fire equipment, and not associated with the release of AFFF. • Sampling completed of ash disposed within ADB reported concentrations below the adopted assessment criteria (HIL-D and ecological indirect exposure), with highest concentrations reported in saturated profiles, and unsaturated profiles generally reporting concentrations below the laboratory's LOR. Ash within ADB is considered to represent a residual source with low PFAS concentrations. • It is noted that a number of ash disposal areas, including Ash Dams 1 and 2 (Callide A) and the Evaporation Ponds ('A' ponds) reported concentrations of PFAS below the laboratory's LOR indicating significant PFAS impacts are unlikely to be present. • One of the samples collected at Ash Dam 4 (AD401-0.5) reported concentrations of PFAS above the ecological indirect criteria of 0.01 mg/kg and based on further investigations is likely to represent a localised area of impact.

CSM Aspect	Discussion/Comment
	• One location at Callide A (CA15) within the NSP reported concentrations of PFOS above the ecological indirect criteria of 0.01 mg/kg, representing layers of coal ash/dust approximately 1.0 m deep. Sampling at other locations within the NSP (CA17 to CA19) reported PFAS concentrations below the assessment criteria and/or the laboratory's LOR, indicating that impacts at CA15 are likely to be localised to the approximately 1.0 m layer of coal ash/dust at this location.
Aquatic Biota	Assessment of aquatic biota tissue contaminants, habitat condition, macroinvertebrate community and aquatic biota target sampling sites along Callide Creek and within Callide Dam and Kroombit Dam reported variability in habitat condition, aquatic biota, and macroinvertebrate communities, however habitat quality overall was in good to excellent condition with assessment at most sites limited due to lower water depth, availability of micro and macrohabitats and by fine substrate content. Impacts to habitat conditions and macroinvertebrate assemblages was reported to be associated with land use disturbances (i.e. agricultural land uses) and not considered to be influenced by the presence of PFAS. PFOS was detected in 15 of the 40 samples collected, with one also reporting detections of PFHxS, with all but one detection reported within Callide Creek downstream of the site. Results indicate bioaccumulation of PFAS is likely to be occurring, noting: • Four of the target human health species (three catfish species and one Yellowbelly) reported concentrations of PFOS exceeding the FSANZ trigger point criteria (FSANZ, 2017) for fish of 5.2 µg/kg for PFOS, with a maximum concentration of 44 µg/kg reported in sample AB5-PR-EP (Rendahl's Catfish). • Twelve target ecological species reported concentrations of PFOS exceeding the PFAS NEMP biota guideline value (for sum of PFOS and PFHxS) for mammalian diet (4.6 µg/kg), and nine of these samples also exceeding the guideline value for avian diet (8.2 µg/kg). All exceedances were reported in sampling locations within Callide Creek downstream of the site, with the highest concentration of 89 µg/kg was reported in sample AB8-AA-WB (Agassiz's Perchlet) within Callide Weir. Highest concentrations of PFOS in aquatic biota were generally associated with highest average surface water PFOS concentrations, with higher concentrations reported in samples collected furthest downstream of the site at the Callide Weir (refer **Figure 26**). It is noted that monitoring locations further downstream from the site (SW41, Callide Weir) comprised larger waterbodies and included the Callide Weir, which may also contribute to higher concentrations in aquatic biota due to the presence of more habitat to support biota and longer residence times due to greater availability of food sources. PFAS was not detected in any of the human health or ecological target species sampled from Callide or Kroombit Dams (including Barramundi and Red Claw Crayfish) indicating risks to human health associated with aquatic biota within Callide Dam is low. Based on results from aquatic biota samples, potential risk exists for: • Higher order organisms including mammals and birds due to exposure to PFAS via consumption of biota from Callide Creek • Human health due to exposure to PFAS via consumption of biota from Callide Creek

15.1 Review of Source-Pathway-Receptor Model

Based on the findings of the current investigation, source, pathway and receptor linkages identified as part of the EE CLID (Epic, 2022c) have been reviewed, with a summary detailed in **Table 49.** Key PFAS migration pathways and CSMs are included in **Appendix E**.

Table 49. Summary of Revised Pathway and Receptor Linkages

Source	Migration Pathways	Status	Receptor(s)	Considerations / Comments
Onsite Migration – Callide B and C Source Areas	**Onsite Surface Water** The primary onsite pathways for migration of PFAS from source areas at Callide B and C is via surface water flows through onsite drainage and overland flow to the DRD and ultimately to Ash Dam B (EMS 2022). Results indicate surface water within the DRD and ADB are generally comparable, however monitoring results for water impounded within ADB (as represented by PW2) may be increasing based on monitoring completed during 2023. Once within Ash Dam B, pathways for PFAS migration include: • Circulation within Ash Dam B via movement of surface water and operational water uses (i.e. dust suppression, ash watering) • Adsorb to ash, sediments and soils within Ash Dam B, although limited PFAS has been identified in ash disposal areas • Infiltrate to groundwater and discharge via deep seepage (approximately 75% recovered and returned to Ash Dam B) • Discharge via shallow seepage (collected as surface water in seepage collection trenches and returned to Ash Dam B) • Licenced stormwater discharges (occasional).	Complete	The receptors associated with the migration pathways in Callide B and C include: • Dermal contact, inhalation or ingestion exposure pathway to site workers operating in areas impacted by PFAS (soil or water) • Plant uptake associated with ecological receptors of current and future revegetated areas (including rehabilitated areas) • Exposure of migratory birds and other transient fauna interacting with the environs of the waste containment facility including the Western Stormwater Diversion Channel	• The risk to site users is considered low based upon the operational conditions and controls required for workers interacting with impacted soils and waters • The current high salinity of the major water bodies onsite (Ash Dam B and Borrow Pits A and B) is likely to preclude consumption or plant uptake pathways associated with ecological (flora and fauna receptors) • Ongoing monitoring proposed to be completed as per Recommendation 8 (refer **Section 16.3**)
	Eastern and Southern Seepage Areas (Groundwater) The estimates of total deeper seepage recovered and fugitive seepage from the eastern and southern seepage areas is 525 m^3/day and 145 - 190 m^3/day respectively (EMS 2024), equating to successful recovery of approximately 70 - 80% of deeper seepage. It is estimated that the mass of the sum of PFOS and PFHxS within water contained within Ash Dam B is between 0.15 kg to 0.6 kg (based on an average concentration of 0.05 µg/L), with the mass of PFAS in fugitive seepage (not recovered) currently estimated to be approximately 0.01 kg per year (EMS 2022). Although PFAS concentrations in MW84 (total PFAS 36.7 – 48.6 µg/L) are significantly higher than results reported as part of the EE CLID	Ongoing Investigation (Refer **Section 16.2**)		• Additional investigation required to assess potential risk and inform potential remediation and/or management of PFAS impacts on site (Refer **Section 16.2**) • Additional works proposed to be completed as per Recommendations 3 and 4 (refer **Section 16.3**)

Source	Migration Pathways	Status	Receptor(s)	Considerations / Comments
	(Epic, 2022c) (MW32 total PFAS 8.12 – 10.50 µg/L), it's not considered to change the current understanding of potential risk associated with the eastern seepage area, with results from existing monitoring wells MW32 and MW43 remaining stable over time. Results report concentrations of PFAS reduce between MW84 and MW32, and then further reduce between MW32 and MW43, with reduction in concentrations likely to continue between MW43 and the likely discharge point to Callide Creek, noting that MW43 and the surrounding monitoring wells are located within the eastern seepage area recovery zone (refer **Figure F6**), and concentrations of surface water in Callide Creek (as represented by SW12) are generally at or below the Drinking Water Criteria.			
	Western Seepage Area (Groundwater) The estimates of seepage recovered and fugitive seepage from the western seepage areas is 77 m^3/day and 26 m^3/day (EMS, 2024), equating to successful recovery of >70% of deeper seepage.	Complete		• Ongoing monitoring proposed to be completed as per Recommendation 8 (refer **Section 16.3**)
	Northern Site Boundary (Surface Water) Surface water entering the site from the direction of the mine, located upgradient (north) of the site was reported to contain elevated concentrations of PFAS, with high PFAS concentrations reported to enter the site from two main watercourses represented by SW34 and BS3 CWN. Upgradient water is diverted around the northern and western boundaries of Ash Dam B via the Western Stormwater Diversion Channel. During large rainfall events, surface water diverted around the site will discharge directly to Callide Creek, with some water retained within the diversion channel. During smaller rainfall events, surface water may be retained within the diversion channel. Water retained within the diversion channel in the southwestern corner of the site is anticipated to infiltrate to groundwater through alluvial soils and eventually the Callide Creek alluvium (EMS 2022). This infiltrated water that has flowed onto site from the northern boundary is captured by the site deep seepage recovery system. Monitoring results also indicate that these upstream flows onto site from the north, have impacted upgradient groundwater, as represented by increasing concentrations of PFAS in MW74 (refer **Section 10.3**).	Ongoing Investigation		• Additional investigation required to confirm the mass flux of PFAS entering the site via the northern site boundary (Refer **Section 16.2**) • Additional works proposed to be completed as per Recommendation 5 (refer **Section 16.3**)

Source	Migration Pathways	Status	Receptor(s)	Considerations / Comments
	Measurement and calculation of PFAS flux entering the site along the northern site boundary has not been established as discussed in **Section 10.4**.			
Onsite Migration – Callide A Source Areas	The primary onsite pathways for migration of PFAS at Callide A is via surface water flows which are directed to the Eastern and Northern Stormwater Ponds (located upstream of the Ash Dam 2 catchment). Sediment comprising coal ash/dust observed in the NSP reported elevated concentrations of PFAS, indicating possible migration of PFAS via transport of sediment from the coal stockpile. Additional investigations did not confirm a specific source area that may be contributing to PFAS impacts reported in the NSP, with a localised impact within accumulated sediments in the NSP the only confirmed potential source area at Callide A. Release of water is authorised under CS Energy's Environmental Authority at Release Point R2, located at the toe of Ash Dam 2. Releases discharge directly into Dunn Creek, however during 2023 CS Energy have been pumping water from R2 release point sump and returning it to the site. PFAS has been detected in surface water within the Eastern and NSP (up to 0.0433 µg/L and 0.0798 µg/L total PFAS respectively), along with water at release point R2 (0.0053 – 0.2020 µg/L total PFAS). Surface water from areas upgradient (north) of Callide A are directed to a mine dam (Dunn Creek Dam) located adjacent to the north-eastern corner of the site. Dunn Creek Dam is an authorised mine affected water release location (Environmental authority EPML00720413 Callide Coal Mine). Concentrations of PFAS in Dunn Creek (upstream of Callide A at SW18) reported concentrations of total PFAS up to 0.244 µg/L (Mar21).	Complete	The receptors associated with the migration pathways in Callide A include: • Dermal contact, inhalation or ingestion exposure pathway to site workers operating in areas impacted by PFAS (soil or water) • Flora ecological receptors of current and future revegetated areas (including rehabilitated areas) • Ecological receptors (aquatic and terrestrial) associated with Dunn Creek and Callide Dam	• The risk to site users is considered low based upon both the decommissioned status of Callide A and the operational conditions and controls required for workers interacting with impacted soils and waters • Dunn Creek is ephemeral in nature until the discharge point into where Dunn Creek mixes with waters in Callide Dam. Samples from this location (SW36) have reported detections of PFAS in October 2022 and June 2023. It is noted that Dunn Creek has historically received discharges from Callide Mine, located north of the site. • Management of impacts to be completed as per Recommendation 1 (refer **Section 16.3**)
Offsite Migration – Surface Water	Offsite migration of PFAS via surface water flow is considered to occur as follows: • Regional surface water flows (including from Callide Power Station and southern portions of the mine) drain towards Callide Creek. • Surface water within Callide Creek flows from east to west. When the aquifer is comparable to the level of Callide Creek	Complete	The receptors associated with the offsite surface water migration pathways include: • Incidental ingestion and dermal contact exposure pathway for recreational users in surface waters	• Surface water results were reported below the recreational guideline values indicating risk is likely to be low to recreational water users • Surface water use for irrigation is likely to be limited, with only

Source	Migration Pathways	Status	Receptor(s)	Considerations / Comments
	(water level high), water will continue as surface water to downstream catchments (bypass flow). When the aquifer is below the level of Callide Creek, surface water will infiltrate into the aquifer. • Callide Creek is generally considered to be losing (surface water infiltrating to groundwater), however in some sections groundwater may discharge to surface water when the underlying aquifer is full (gaining). The current and historical mass and flux of PFAS in surface water is considered to be highly variable, and influenced by release of PFAS from source areas (historical releases higher than current releases), rainfall within the catchment, water released from Callide Dam and the water levels of the underlying aquifer. Results from aquatic biota sampling reported detections of PFOS in 15 of the 40 samples collected, with one of these samples also reporting detections of PFHxS. With the exception of one sample collected upstream of Callide Dam, all detections of PFAS in aquatic biota were reported within Callide Creek downstream of the site. Samples collected from Callide Dam and Kroombit Dam reported no detectible PFAS. Four of the target human health species reported concentrations of PFOS exceeding the FSANZ trigger point criteria (FSANZ, 2017) for fish of 5.2 µg/kg for PFOS, with a maximum concentration of 44 µg/kg reported in sample AB5-PR-EP (Rendahl's Catfish). PFAS was not detected in any of the human health target species sampled from Callide or Kroombit Dams (including Barramundi and Red Claw Crayfish). Twelve samples reported concentrations of PFOS exceeding the PFAS NEMP biota guideline value (for sum of PFOS and PFHxS) for mammalian diet (4.6 µg/kg), with nine of these samples also exceeding the guideline value for avian diet (8.2 µg/kg). All exceedances were reported in sampling locations within Callide Creek downstream of the		(Lake Callide and Callide Creek) • Human consumption of edible aquatic biota caught from Lake Callide or Callide Creek • Landholders utilising waters from Callide Creek for irrigation of consumable products and subsequent ingestion (i.e. poultry, vegetables, cattle) • Aquatic organisms in direct contact with waters impacted by PFAS (bioaccumulation) • Higher order terrestrial / avian organism consuming aquatic organisms from Callide Creek	a minority of landholders identified abstracting water from Callide Creek • Concentrations of PFOS and PFHxS reported in Callide Dam were reported below the laboratory's LOR, however results indicate PFAS is discharged to Callide Dam via the Dunn Creek catchment which could potentially be present in biota • Offsite concentrations of surface water reported below the 95% species protection limit, and sediment below the ecological direct and indirect exposure criteria, as such direct ecological exposure is likely to be low risk • Based on current advice from the DAF, there is no evidence to suggest PFAS has a detrimental effect on stock health at levels likely to be found in contaminated areas • Biota results indicate potential risks may exist to human health due to PFAS exposure via consumption of biota, and higher order organisms including mammals and birds due to PFAS exposure via consumption of biota • HHERA proposed to be completed as per

Source	Migration Pathways	Status	Receptor(s)	Considerations / Comments
	site, with the highest concentration of 89 µg/kg was reported in sample AB8-AA-WB (Agassiz's Perchlet) within Callide Weir.			Recommendation 7, with ongoing monitoring proposed to be completed as per Recommendation 8 (refer **Section 16.3**)
Offsite Migration – Groundwater	Within the Callide Creek alluvium, concentrations of PFAS are variable, but present throughout the offsite investigation area. Water movement within the Callide Creek Alluvium occurs at a rate of 4.2 m/day, with water moving from east to west and expanding (north-south) with the aquifer. Since the commissioning of Callide B Power Station, groundwater may have moved up to 17 km down the Callide Valley. Migration of PFAS is considered to mirror water movement, however migration of PFAS will occur at a slower rate. A number of mechanisms are considered to have influenced the current distribution of PFAS within the aquifer. These include: • Current and historical releases of PFAS from Callide Power Station, and other potential PFAS sources. It is noted that the current mass of PFAS entering the alluvium is considered to be lower than historical volumes, and will continue to decrease with time following cessation of AFFF use and remediation of primary source areas. • Recharging of the aquifer by surface water is likely to dilute PFAS within central areas of the alluvium (along the alignment of Callide Creek). The higher concentrations along the northern and southern margins of the aquifer are considered to represent the longer-term background concentrations prior to the commencement of surface water releases from Callide Dam which commenced in 2011. Some variability and seasonality is observed in the groundwater monitoring wells, particularly ones located in proximity to Callide Creek associated with inflows (from both contaminated [i.e. diverted water from the northern site boundary] and uncontaminated areas) and releases from Callide Dam.	Complete	The receptors associated with the groundwater offsite migration pathways include: • Human consumption of untreated groundwater for drinking water • Incidental ingestion and dermal contact exposure pathway for recreational users in water sourced from groundwater (i.e. swimming pools) Landholders utilising extracted groundwater for irrigation of consumable products and/or watering of livestock and subsequent consumption (i.e. poultry, vegetables, cattle) • Plant uptake from shallow groundwaters within the alluvial aquifer	• Where groundwater has been identified above the drinking water criteria, and is currently being used for drinking water, CS Energy are providing alternate water supply solutions including supply of bottled water, town water and/or installation/upgrade of rainwater collection tanks • Groundwater water results were reported below the recreational guideline values indicating risk is likely to be low to recreational water users • Based on current advice from DAF, there is no evidence to suggest PFAS has a detrimental effect on plant health or stock health at levels likely to be found in contaminated areas • HHERA proposed to be completed as per Recommendation 7, with ongoing monitoring proposed to be completed as per Recommendation 8 (refer **Section 16.3**)

15.2 Human Health Risks

Based on the findings of the current investigation, the following risks to human health have been identified:

- Low risk to users of the site, including site workers, from exposure to PFAS impacts soil, sediment, groundwater and surface water. Risk to site users is considered to be low based on current work health and safety controls implemented at the site, including the Site Permit to Work (PTW) and Penetration Permitting systems which regulate all ground disturbance activities.
- Low risk to users of offsite surface water, including activities such as walking, wading, swimming and fishing. Concentrations of PFAS in Callide Creek and Dunn Creek were reported below the recreational guideline values indicating risk is likely to be low.
- Potential risks to users of surface water for watering of produce with concentrations of PFAS above the drinking water guidelines adopted for assessment of irrigation of home produce (herbs, fruits and vegetables) and watering of produce including chickens (and consumption of eggs). It is noted that limited surface water use has been identified for these purposes due to the accessibility and use of groundwater.
- Potential risks to human consumers of aquatic biota caught in Callide Creek downstream of the site based on aquatic biota sampling which reported four target human health species with concentrations of PFOS exceeding the FSANZ trigger point criteria (FSANZ, 2017) for fish of 5.2 µg/kg for PFOS, with a maximum concentration of 44 µg/kg reported in sample AB5-PR-EP (Rendahl's Catfish). PFAS was not detected in any of the human health target species sampled from Callide or Kroombit Dams (including Barramundi and Red Claw Crayfish) indicating risk from consumption of aquatic biota within Callide Dam is low.
- Potential risks to users of groundwater for drinking and watering of produce with concentrations of PFAS above the drinking water guidelines (i.e. herbs, fruit and vegetables) and watering of produce including chickens (and consumption of eggs). Assessment of risks to human health via the drinking water pathway has been completed as part of a separate scope of work, with sampling undertaken of 84 landowners located downstream of the site. Where groundwater has been identified above the drinking water criteria, and is currently being used for drinking water,
  CS Energy are providing alternate water supply solutions including supply of bottled water, town water and/or installation/upgrade of rainwater collection tanks.

It is noted that no visual recreation and cultural and spiritual values were identified. It is considered that protection of human and ecological health will encompass protection of wider cultural and spiritual values.

To further assess potential risks to human health, CS Energy have commissioned a risk assessor to complete a HHERA based on current investigation findings (refer **Section 16.3**).

15.3 Ecological Risks

Based on the findings of the current investigation, the following risks to ecological receptors have been identified:

- Potential risks to aquatic organisms (direct toxicity) due to exposures to PFAS in surface water and sediments is considered to be low, with offsite concentrations of surface water reported below the 95% species protection limit, and sediment below the ecological direct and indirect exposure criteria.
- Potential risks to higher organisms such as birds and mammals due to exposure to PFAS via consumption of aquatic biota caught in Callide Creek downstream of the site based on aquatic biota sampling which reported 12 target ecological species with concentrations of PFOS exceeding the PFAS NEMP biota guideline value (for sum of PFOS and PFHxS) for mammalian diet (4.6 µg/kg), and nine of these samples also exceeding the guideline value for avian diet (8.2 µg/kg). All exceedances were reported in sampling locations within Callide Creek downstream of the site, with the highest concentration of 89 µg/kg was reported in sample AB8-AA-WB (Agassiz's Perchlet) within Callide Weir. PFAS was not detected in any of the ecological target species sampled from Callide or Kroombit Dams, with one sample collected upstream of Callide Dam reporting detections of PFOS below the biota guideline values, indicating ecological risks within and upstream of Callide Dam is low.
- Potential risks associated with potential uptake and bioaccumulation of PFAS within vegetation including agricultural crops and home produce with groundwater and surface water concentrations reported above

the drinking water criteria. It is noted that based on current advice from the DAF, there is no evidence to suggest PFAS has a detrimental effect on plant health at levels likely to be found in contaminated areas.

It is noted that based on current advice from DAF (DAF, 2017), there is no evidence to suggest PFAS has a detrimental effect on plant or stock health at levels likely to be found in contaminated areas.

To further assess potential risks to ecological receptors, CS Energy have commissioned a risk assessor to complete a HHERA based on current investigation findings (refer **Section 16.3**).

16 CONCLUSIONS AND RECOMMENDATIONS

16.1 Conclusions

In accordance with Requirement 8 of EE E-100046349, and correspondence received by DES on 4 October 2022, additional site investigations have been completed at the Callide Power Station site to address identified data gaps and recommendations of the EE CLID (Epic, 2022c) submitted under EE Requirement 5, and enable preparation of a final environmental report demonstrating that the requirements of the EE have been completed.

Investigation works have been completed within Lots 1 RP615528 and 4 SP103557, and surrounding areas, in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 2013*, the *Queensland Auditor Handbook for Contaminated Land February 2019* and the *PFAS National Environmental Management Plan, Version 2.0, January 2020*.

A summary of investigation findings associated with groundwater, surface water, sediment, soil and aquatic biota, incorporating findings of the EE CLID (Epic, 2022c) and the additional site investigations (this report) are presented in **Section 15**, with partly remaining data gaps discussed in **Section 16.2**.

Based on the findings of site investigations, the site is considered to be contributing to PFAS impacts identified within the receiving environment, including Dunn Creek, Callide Creek and the associated alluvial groundwater aquifer, noting that a number of existing measures have been adopted to reduce potential impacts and offsite releases from the site including:

- Establishment of a seepage recovery network between Ash Dam B and Callide Creek, comprising of seepage recovery wells located in the western, southern and eastern seepage areas. Current estimates (EMS, 2024) indicate that >70% of seepage is recovered, with fugitive seepage from the combined eastern/southern and western seepage areas estimated to be 145 - 190 m^3/day and 26 m^3/day respectively (EMS, 2024).
    - Five additional seepage recovery bores (MW81, MW82, MW83, MW85 and MW90) were installed in August 2023 in the eastern seepage area to support seepage recovery at the site
- Recovery of seepage from the Callide A release point R2 (via vacuum excavation truck).
- Remediation of soils at the FOT and FTG with elevated concentrations of PFAS, with approximately 1.3 kg of PFAS chemically stabilised, and reporting a reduction in the leachability of PFAS of >99.7%.
- Removal and offsite disposal of PFAS impacted concrete comprising the former FTG bund, with an estimated 0.1 kg of PFAS removed from the site.

16.2 Remaining Data Gaps

Based on the findings of additional site investigations completed at the site, the majority of identified data gaps are considered to have been investigated to inform the requirements of EE Requirement 5. Three data gaps (data gaps 4, 6 and 7) partly remain:

- **Eastern Seepage Area (Data Gap 4):** Investigations completed in the eastern seepage area have confirmed the presence of two seepage pathways, with the nature and extent of the seepage pathway further established. As part of current investigations, MW84 reported concentrations of PFAS significantly higher than previous results reported in the eastern seepage area. In addition, elevated concentrations of PFAS were reported in a sediment sample collected from the eastern diversion channel. Results for MW84 are not considered to change the current understanding of potential risk associated with the eastern seepage area based on stable concentrations observed in hydraulically downgradient bores MW32 and MW43 (refer **Section 8.3**). Additional investigation of the following items will assist in further understanding potential risk and informing potential remediation and/or management of PFAS impacts:
    - Due to the elevated concentrations of PFAS reported in MW84, future assessment to establish the source of impacts is recommended to assist in informing the ongoing management of PFAS in the eastern seepage area. The nearest known PFAS source area to MW84 (with high PFAS concentrations) is the FOT, located approximately 900 m north, however confirmation that

PFAS at MW84 is associated with the FOT, and/or the inferred geological fault line has not been established. It is noted that the existing seepage recovery system is likely to include recovery of seepage from this pathway, with additional seepage recovery bores installed in proximity to MW84 and southern portions of the seepage pathway. These additional seepage recovery bores will, when operational, assist in further reducing seepage.

- Current investigation results report the reduction of PFAS concentrations along the MW84-MW32-MW43 seepage pathway, however estimates of fugitive seepage from this pathway, and likely concentrations at the discharge point to Callide Creek have not been established. As noted above, seepage from this pathway is expected to be recovered by the existing seepage recovery system, and inclusion of new seepage recovery bores will assist in further reducing fugitive seepage. In addition, concentrations of surface water in Callide Creek at the inferred discharge point to Callide Creek (as represented by SW12) are generally reported at or below the Drinking Water Criteria.

- **Northern Boundary (Data Gap 6):** Concentrations of PFAS have been reported to be entering the northern boundary of the site via surface water, with surface water, groundwater and sediment impacts identified within the northern and Western Stormwater Diversion Channels. Additional investigations have not confirmed the mass flux of PFAS entering the site (refer **Section 10.4**) as such, further investigation will be required to confirm the mass flux of PFAS entering the site via these pathways. It is noted that additional investigation identified two additional watercourses entering the northern site boundary (as represented by BS3 CWE and BS3 CWN). As detailed in **Section 10.4**, CS Energy have commissioned a third party to install engineering solutions at the location of SW33 and SW34 to facilitate monitoring of water flows entering the site along the northern boundary.

- **Human and Ecological Health (Data Gap 7):** Potential risks to human and ecological health have been identified as detailed in **Section 15.2** and **Section 15.3** respectively. Further assessment of risk is required to quantify potential risks to human and ecological receptors. It is noted this work has commenced with CS Energy commissioning a risk assessor to complete a human health and ecological risk assessment (HHERA) to inform potential risks to ecological receptors.

16.3 Recommendations

Based on the findings of this site investigation and conclusions outlined above, the site is considered to be contributing to PFAS impacts identified within the receiving environment, including Dunn Creek, Callide Creek and the associated alluvial groundwater aquifer. It is noted however, that CS Energy have implemented a number of measures to reduce potential impacts and offsite releases from the site, and contribution of PFAS impacts from upstream/upgradient land uses has also been identified, in addition to potential downstream PFAS sources.

Based on the findings of this additional investigation, and in consideration of the findings of the EE CLID (Epic, 2022c) and remaining data gaps detailed in **Section 16.2**, the following recommendations are made in accordance with Requirements 5(e) and 5(f) of EE E-100046349:

1. Removal of localised impacts within the NSP at Callide A, to minimise potential migration of PFAS to Dunn Creek. PFAS impacts were reported in accumulated sediment within the NSP in the vicinity of investigation location CA15, with PFAS reported in surface water (SW44), seepage (R2) and groundwater (MW97) likely associated with this localised impact. Removal of sediments from the NSP will also assist in restoring the storage capacity of the NSP and minimise potential contribution to seepage at R2. Following removal of accumulated sediment in the NSP, review of current seepage management at R2 should be completed to determine if additional management controls are required to prevent offsite release of PFAS via this pathway.
2. Groundwater recovery bores (which have been tested and appropriate recovery results) installed in the eastern seepage recovery area should be incorporated into the current seepage recovery system to improve seepage recovery rates and further reduce fugitive seepage from the site. Equipping of recovery bores and incorporation into the existing seepage recovery system should be informed by CS Energy's

hydrogeologist and consider relevant operational requirements and approvals (noting recovery bore MW90 is located offsite within the Cocups Road road corridor). Based on elevated concentrations of PFAS in MW84, consideration should be given to installation of a groundwater recovery bore at this location. It is also recommended that a PFAS water treatment plant be incorporated into the existing site water management system. Consideration to be given to the location of such a system: options to consider include: seepage recovery system to treat seepage recovered from the eastern seepage area to remove PFAS prior to pumping into ADB; or installation of additional processing steps to remove PFAS as part of the main site water treatment plant.

3. Further assessment should be undertaken to establish the source of elevated PFAS concentrations reported at MW84 and EDC-SED-6, including assessment of potential association with the FOT and/or the inferred geological fault line, or whether impacts are associated with an alternative source area.
4. Further assessment should be undertaken to assess potential fugitive seepage from the MW84-MW32-MW43 seepage pathway, and likely concentrations at the discharge point to Callide Creek. Assessment should be completed in conjunction with assessment and management of the eastern seepage recovery area noting that seepage from this pathway is expected to be recovered by the existing seepage recovery system, and inclusion of new seepage recovery bores will assist in further reducing fugitive seepage.
5. Management of impacted surface water, groundwater and sediments along the northern site boundary will be required, however it is noted that the source of PFAS impacts is located upstream and offsite and owned by a third party. It is recommended that CS Energy work in collaboration with upgradient landowner(s) and DESI to determine appropriate management of identified impacts. Once upstream, offsite impacts have been adequately remediated or managed, measures should be implemented to manage any residual impacts (e.g. removal of impacted sediment).
6. Ongoing management of the FOT and FTG areas will be required, with management to be informed by results of remediation and validation works, along with previous investigation of the surrounding area. As part of management of residual soil impacts, the FOT and FTG should be incorporated into CS Energy's Site Permit to Work (PTW) and Penetration Permitting systems.
7. A Human Health and Ecological Risk Assessment (HHERA) should be completed to assess potential risks identified for human health (refer **Section 15.2**) and ecological receptors (refer **Section 15.3**). It is noted CS Energy have commissioned a risk assessor to complete a HHERA based on current investigation findings.
8. Monitoring of groundwater and surface water should continue at select groundwater and surface water locations across the site and within the study area to provide ongoing assessment of PFAS. The monitoring locations should target key migration pathways and the receiving environment to monitor potential impacts to human health and ecological receptors. Monitoring should also include monitoring locations which inform the effectiveness of and/or impacts associated with implementation of remediation and management works undertaken at the site.
9. Callide Power Station's Environmental Authority EPPR00536313 Condition 2(G3) outlines the requirements of a groundwater monitoring program and that "The submitted ground water monitoring program must be maintained". It is recommended that the Callide Power Station ground water monitoring program be updated to include:
    a. Nominated groundwater and surface water locations as identified to provide ongoing assessment of PFAS as outlined in the recommendation above
    b. PFAS monitoring constituents for each location.

16.4 Site Suitability Statement

In accordance with Section 389 (2)(b), Lots 1 RP615528 and 4 SP103557 are considered to comprise prescribed contaminated land[11] based on concentrations of PFAS reported in soil, sediment, groundwater and surface water which have the potential to cause environmental harm.

In accordance with Module 6 of the Queensland Auditor Handbook for Contaminated Land, it is considered that Outcome 4 is relevant for the site - The land described as Lot 1 RP615528 and 4 SP103557 (as shown on **Figure 1**) is contaminated by PFAS (including PFOS and PFHxS) affecting soil, sediment, groundwater and

[11] In accordance with Section 389 (4) of the EP Act, prescribed contaminated land means land contaminated in a way that is a risk of causing environmental harm to (a) land other than the relevant land; or (b) human health; or (c) another part of the environment

surface water. As of the date of this report, the land is currently being investigated, and there is insufficient information to determine site suitability at this time. Further investigation will be required to be completed at the site to address identified data gaps (**Section 16.2**) and relevant recommendations (**Section 16.3**).

17 REFERENCES

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- Epic (2022a) Callide Power Station – Environmental Evaluation – Sampling Analysis and Quality Plan, 28 February 2022
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18 ACRONYMS

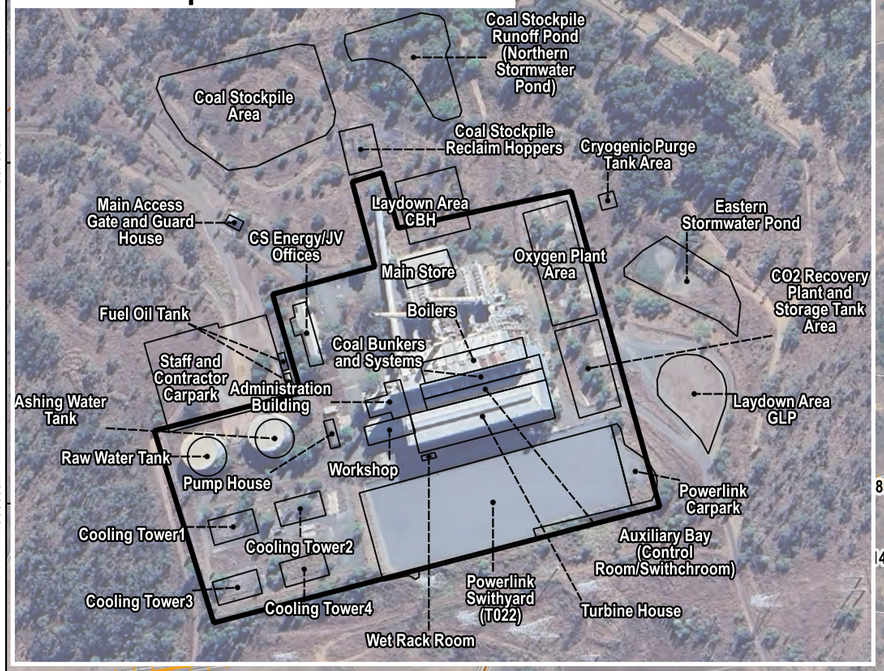
- AFFF Aqueous Film-Forming Foams
- AD1 Ash Dam 1
- AD2 Ash Dam 2
- AD3 Ash Dam 3
- AD4 Ash Dam 4
- ADB Ash Dam B
- AHD Australian Height Datum
- ASLP Australian Standard Leaching Procedure
- CLA Contaminated Land Auditor
- CLID Contaminated Land Investigation Document
- CLR Contaminated Land Register
- COPC Contaminants of Potential Concern
- CSM Conceptual Site Model
- DES Department of Environment and Science (currently DESI)
- DESI Department of Environmental Science and Innovation
- DRD Drains Reclaim Dam
- DRNME Department of Natural Resources, Mines and Energy
- EA Environmental Authority
- EDC Eastern Diversion Channel
- EE Environmental Evaluation
- EMR Environmental Management Register
- ERA Environmentally Relevant Activities
- ERI Electrical Resistivity Imaging
- ERT Emergency Response Team
- ESCP Eastern Seepage Collection Pond
- ESCT Eastern Seepage Collection Trench
- EtFOSA N-Ethyl perfluorooctane sulfonamide
- EtFOSAA N-Ethyl perfluorooctane sulfonamidoacetic acid
- EtFOSE N-Ethyl perfluorooctane sulfonamidoethanol
- EV Environmental Values
- FOSA Perfluorooctane sulfonamide
- FOT Fuel Oil Tanks (Callide B and C)
- FSA Fluorotelomer Sulfonic Acids
- FTG Fire Training Grounds (Callide B and C)
- FTS Fluorotelomer sulfonic acid
- GDE Groundwater Dependent Ecosystem
- HDPE High-density polyethylene
- HHERA Human Health and Ecological Risk Assessment
- ITR Inspection and Test Report
- LDPE Low-density polyethylene
- LOR Limit of Reporting
- MeFOSA N-Methyl perfluorooctane sulfonamide
- MeFOSAA N-Methyl perfluorooctane sulfonamidoacetic acid
- MeFOSE N-Methyl perfluorooctane sulfonamidoethanol
- ML Megalitre
- MW Megawatt
- NATA National Association of Testing Authorities Australia
- NEMP National Environmental Management Plan
- NSDC Northern Stormwater Diversion Channel
- NSP Northern Stormwater Pond (Callide A)
- NUDLC National Uniform Drillers Licensing Committee

- PAC Powdered Activated Carbon
- PCA Perfluoroalkyl Carboxylic Acids
- PFAS Per- and poly-fluoroalkyl substances
- PFBA Perfluorobutanoic acid
- PFBS Perfluorobutane sulfonic acid
- PFDA Perfluorodecanoic acid
- PFDS Perfluorodecane sulfonic acid
- PFHpA Perfluoroheptanoic acid
- PFHpS Perfluoroheptane sulfonic acid
- PFHxA Perfluorohexanoic acid
- PFHxS Perfluorohexane sulfonic acid
- PFNA Perfluorononanoic acid
- PFOA Perfluorooctanoic acid
- PFOS Perfluorooctane sulfonic acid
- PFPeA Perfluoropentanoic acid
- PFPeS Perfluoropentane sulfonic acid
- PFPoDA Perfluorododecanoic acid
- PFTeDA Perfluorotetradecanoic acid
- PFTrDA Perfluorotridecanoic acid
- PFUNDA Perfluoroundecanoic acid
- PSA Perfluoroalkyl Sulfonic Acids
- PTW Permit to Work
- RAP Remediation Action Plan
- RO Reverse Osmosis
- SAQP Sampling Analysis and Quality Plan
- SQP Suitably Qualified Person
- SWL Standing Water Level
- TCLP Toxicity Characteristic Leaching Procedure
- TEP Transitional Environmental Program
- TOF Total Organofluorine
- TOPA Total Oxidisable Precursor Assay
- WCF Waste Containment Facility
- WSCP Western Seepage Collection Pond
- WSCT Western Seepage Collection Trench
- WSDC Western Stormwater Diversion Channel
- µg/kg Micrograms per kilogram
- µg/L Micrograms per litre

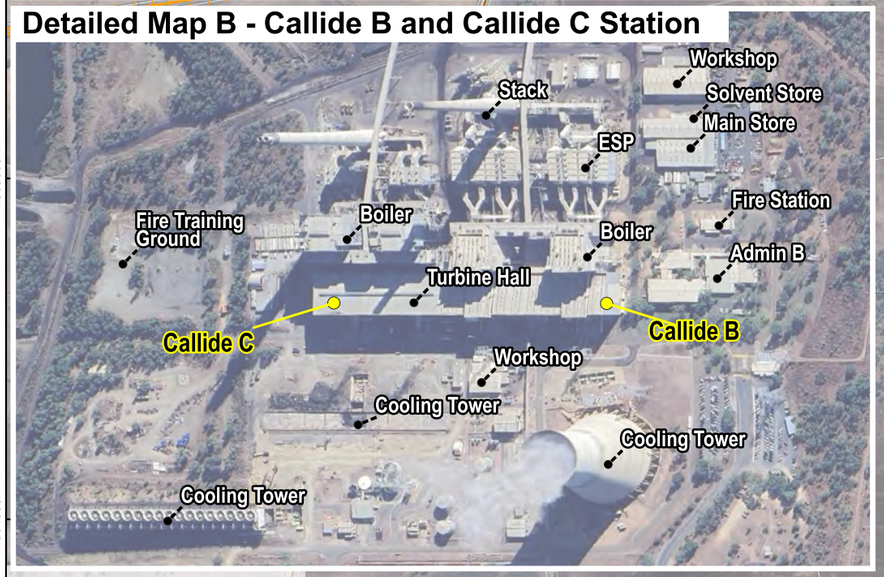
FIGURES

Figure F1. Site Features and Layout
Figure F2. Groundwater Monitoring Locations
Figure F3. Surface Water Monitoring Locations
Figure F4. Ash Dam 4 Investigation Locations
Figure F5. Callide A Investigation Locations
Figure F6. Eastern Seepage Area
Figure F7. Western Seepage Area
Figure F8. Northern Boundary and Dunn Creek Monitoring Locations
Figure F9. Aquatic Biota Investigation Locations
Figure F10. Soil Validation Samples – Fuel Oil Tanks
Figure F11. Soil Validation Samples – Fire Training Ground
Figure F12. Long-term Concentration Trend – Callide Creek

Detailed Map A - Callide A Station



Detailed Map B - Callide B and Callide C Station

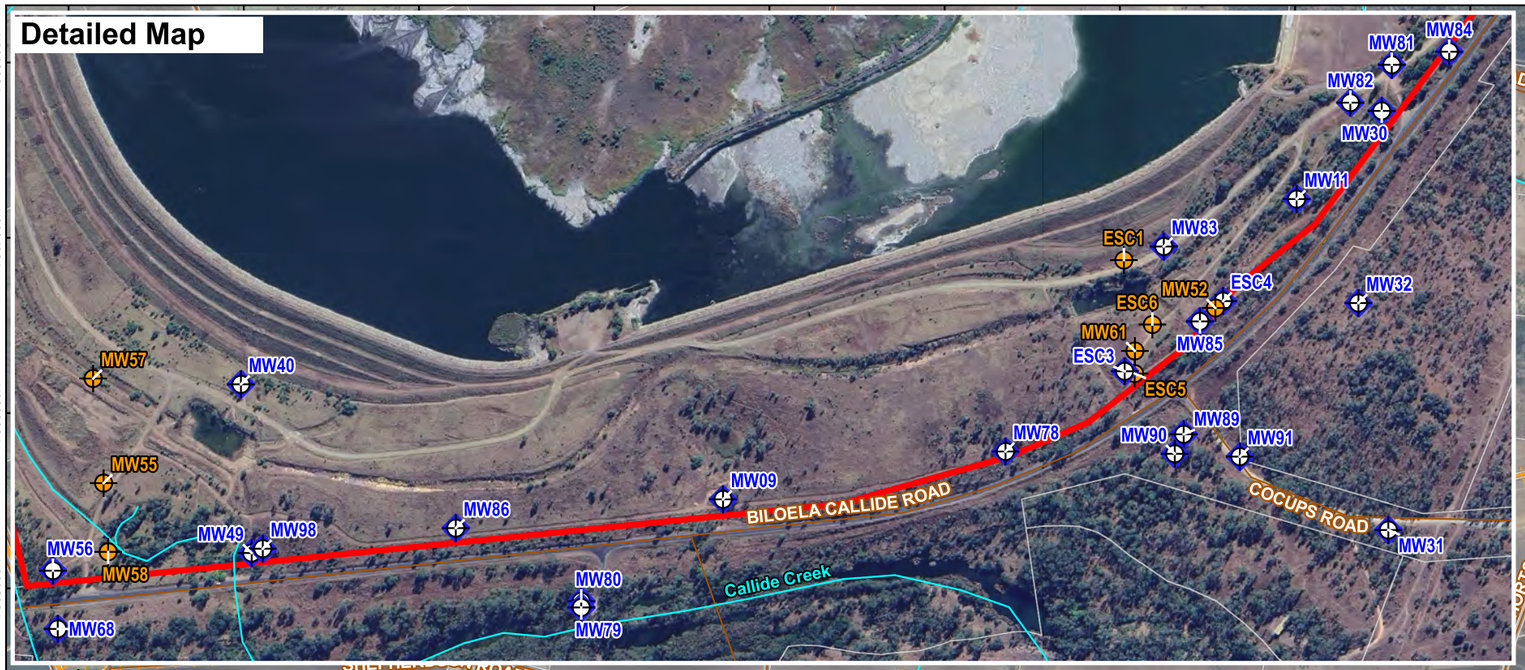


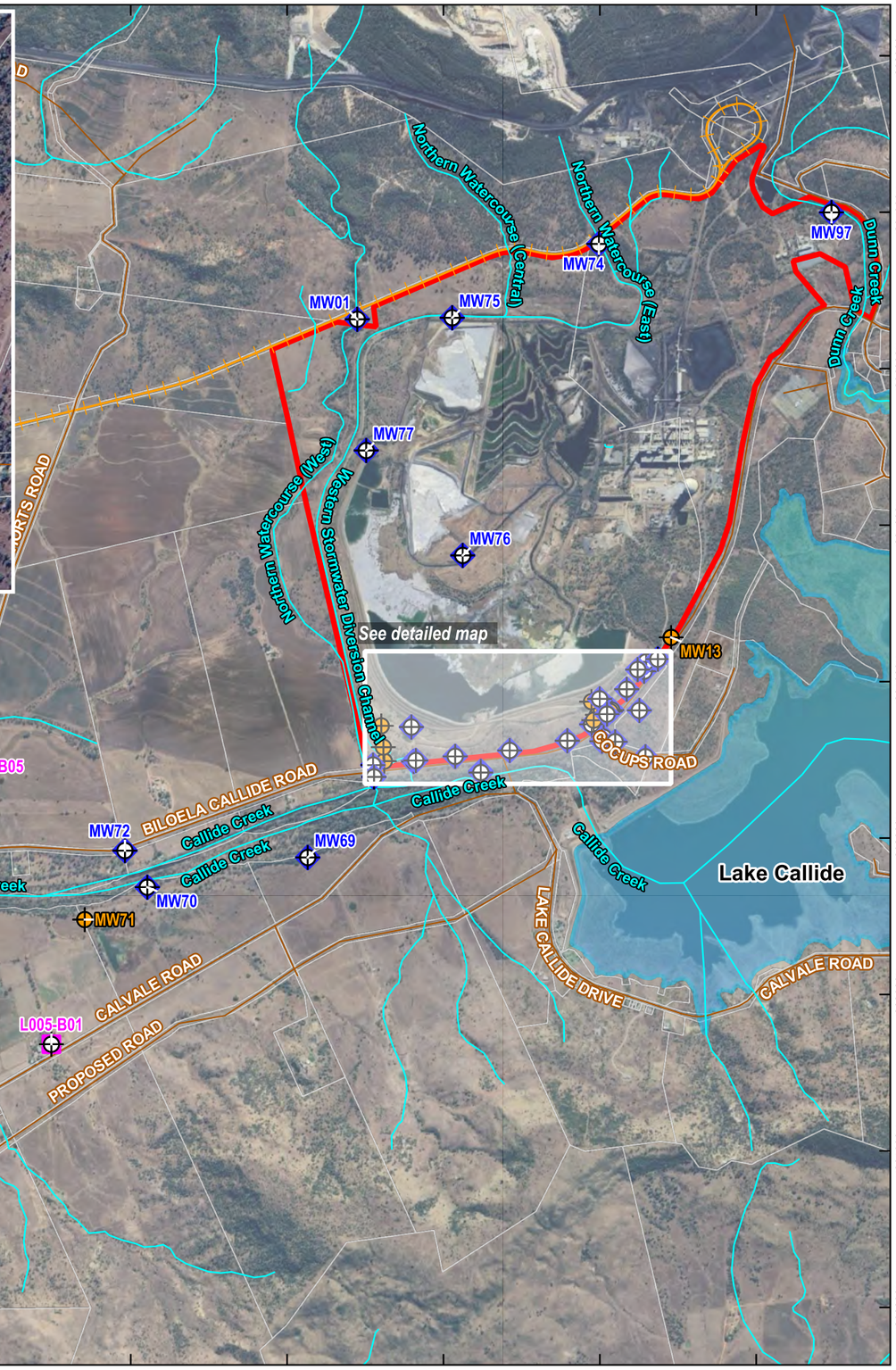
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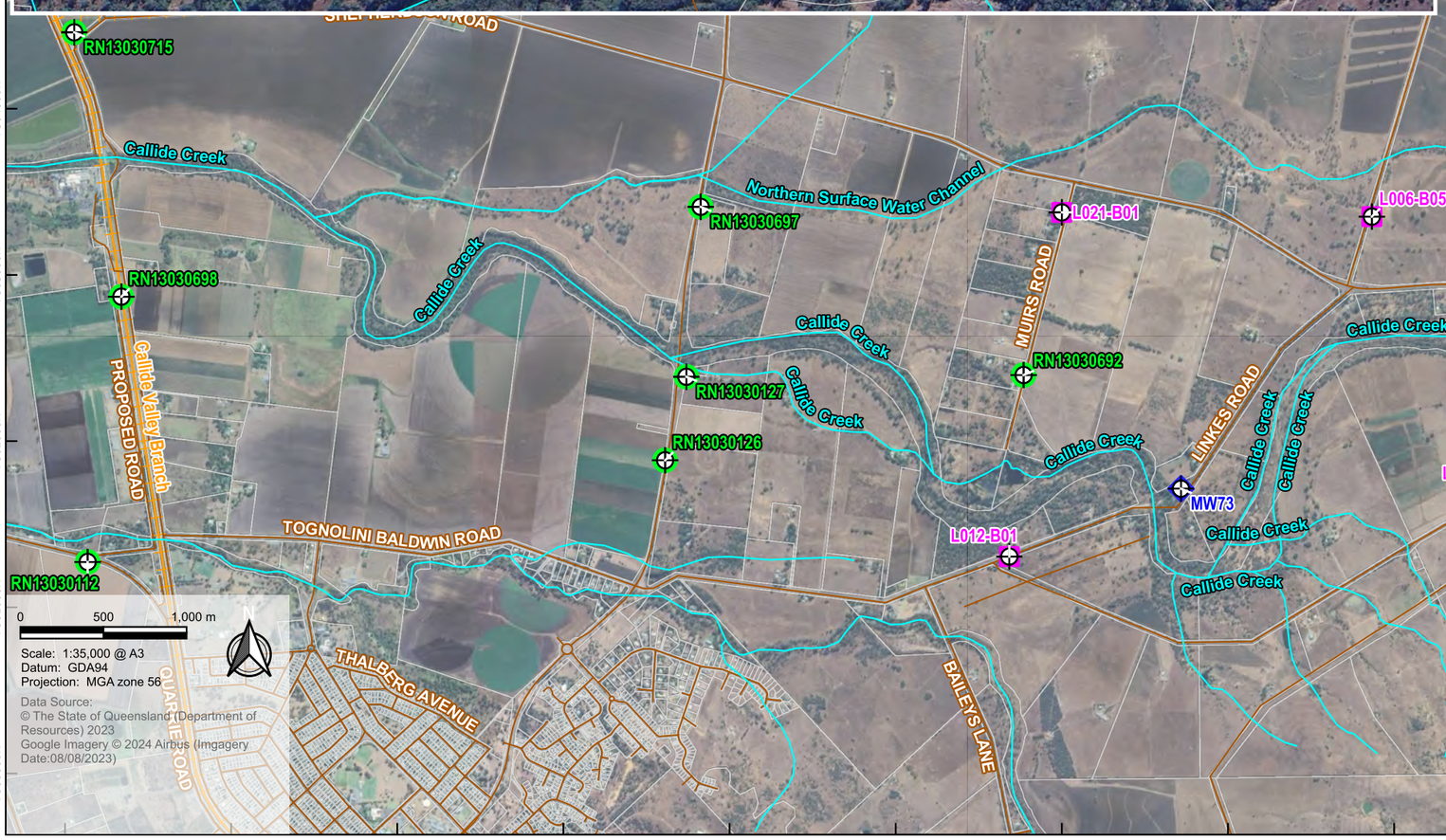
- Callide power station - site boundary
- Ash Dam B catchment area
- Lake Callide
- Spillway
- Cadastre (DCDB)
- Railways
- Roads and tracks
- Watercourses

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Figure F1
Site features and layout







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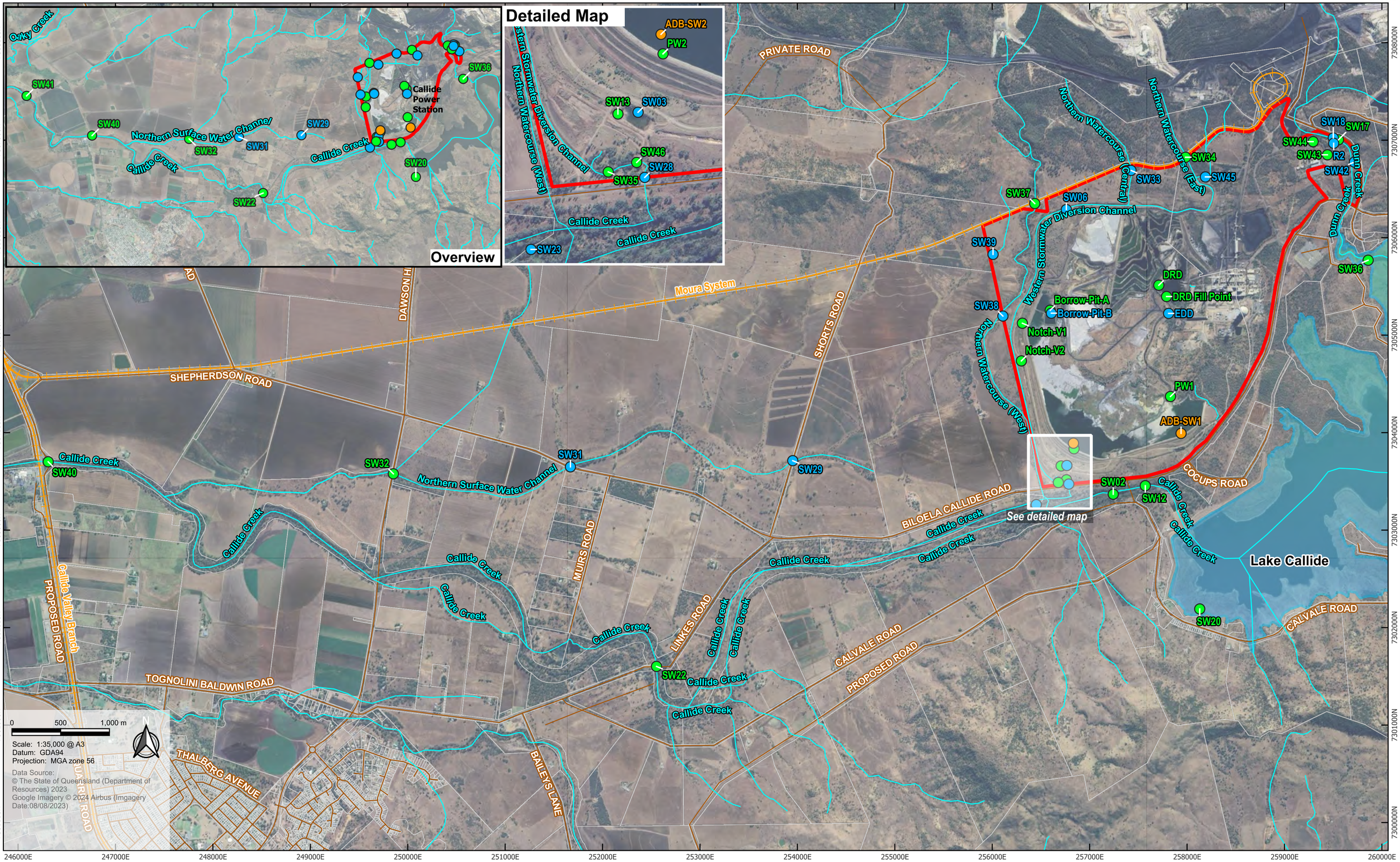
Legend

- Callide power station - site boundary
- Lake Callide
- Cadastre (DCDB)
- Railways
- Roads and tracks
- Watercourses
- Previous groundwater investigation locations
- Groundwater investigation locations (Quarterly scope)
- CS Energy bore
- Landholder bore
- DRDMW bore

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Figure F2
Groundwater monitoring locations

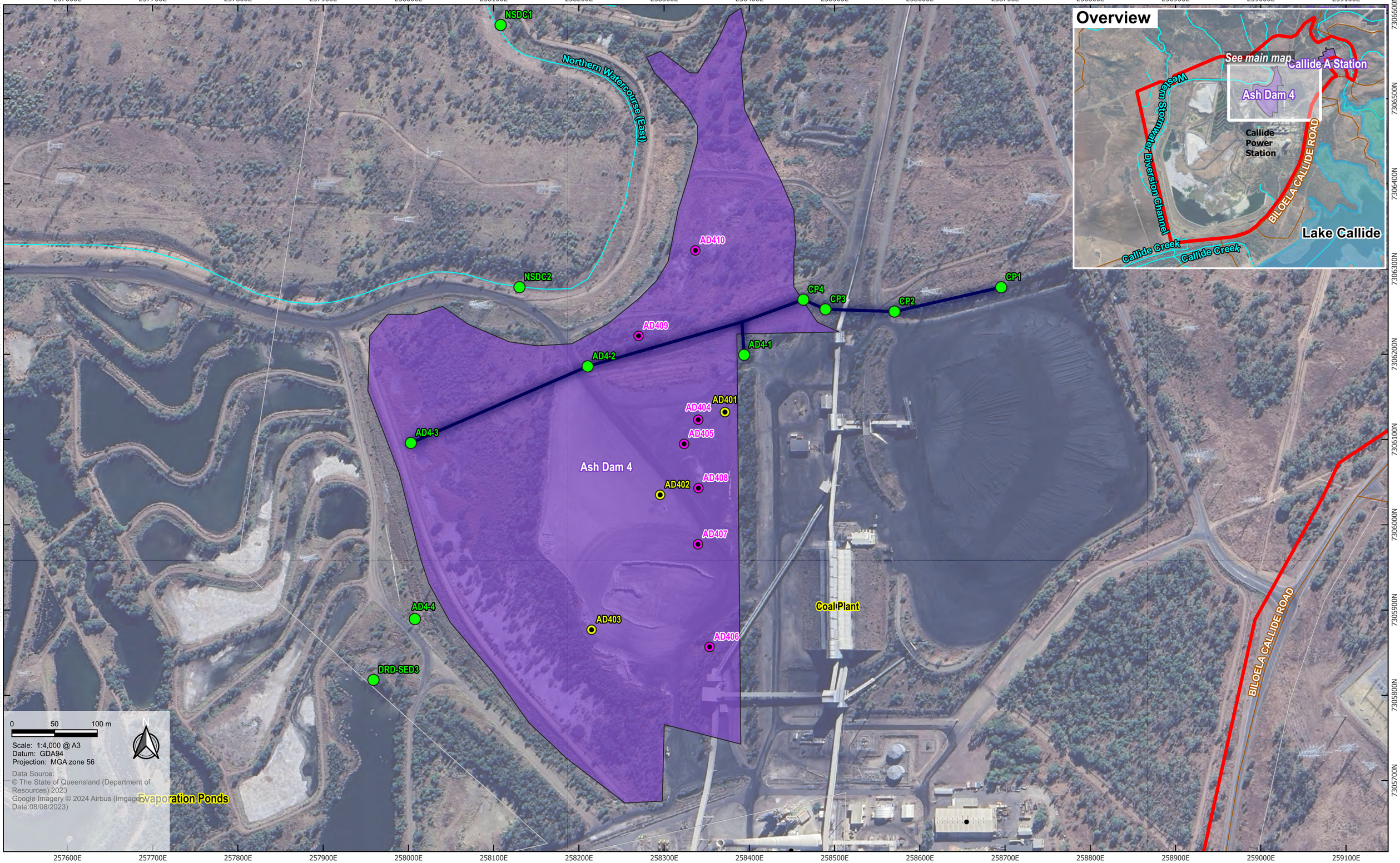


Legend

- Callide power station - site boundary
- Lake Callide
- Cadastre (DCDB)
- Railways
- Roads and tracks
- Watercourses
- Stratification sampling location
- Surface water investigation locations (Quarterly scope)
- Previous surface water investigation locations

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PFAS investigation (Callide Power Station)
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Figure F3
Surface water monitoring locations

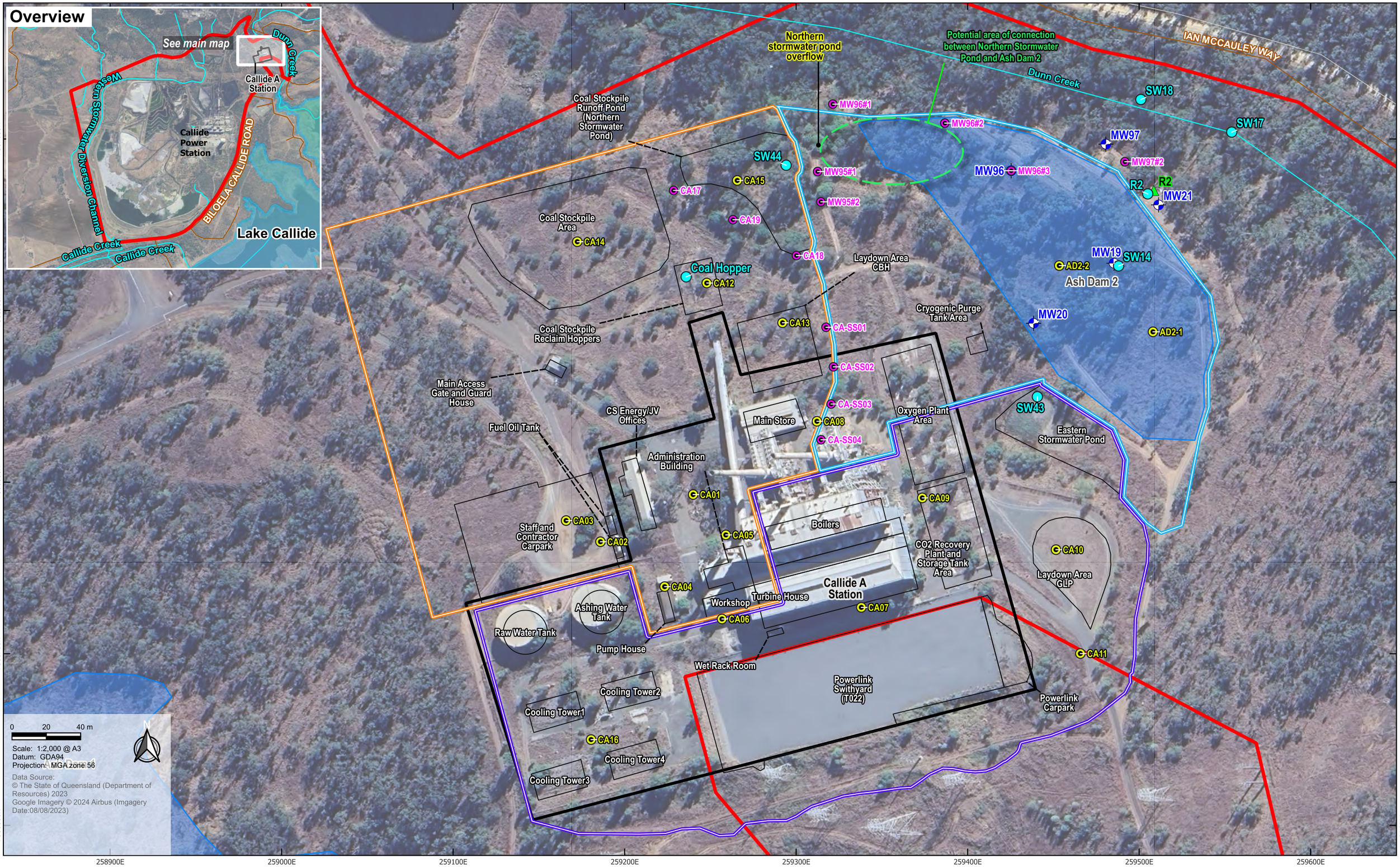


Legend

- Callide power station - site boundary
- Area of interest
- Cadastre (DCDB)
- Coal pant and Ash Dam 4 drainage channel
- Roads and tracks
- Watercourses
- Previous soil investigation location (Epic, 2022c)
- Previous sediment sample location (Epic, 2022c)
- Soil investigation locations

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Figure F4
Ash Dam 4 investigation locations



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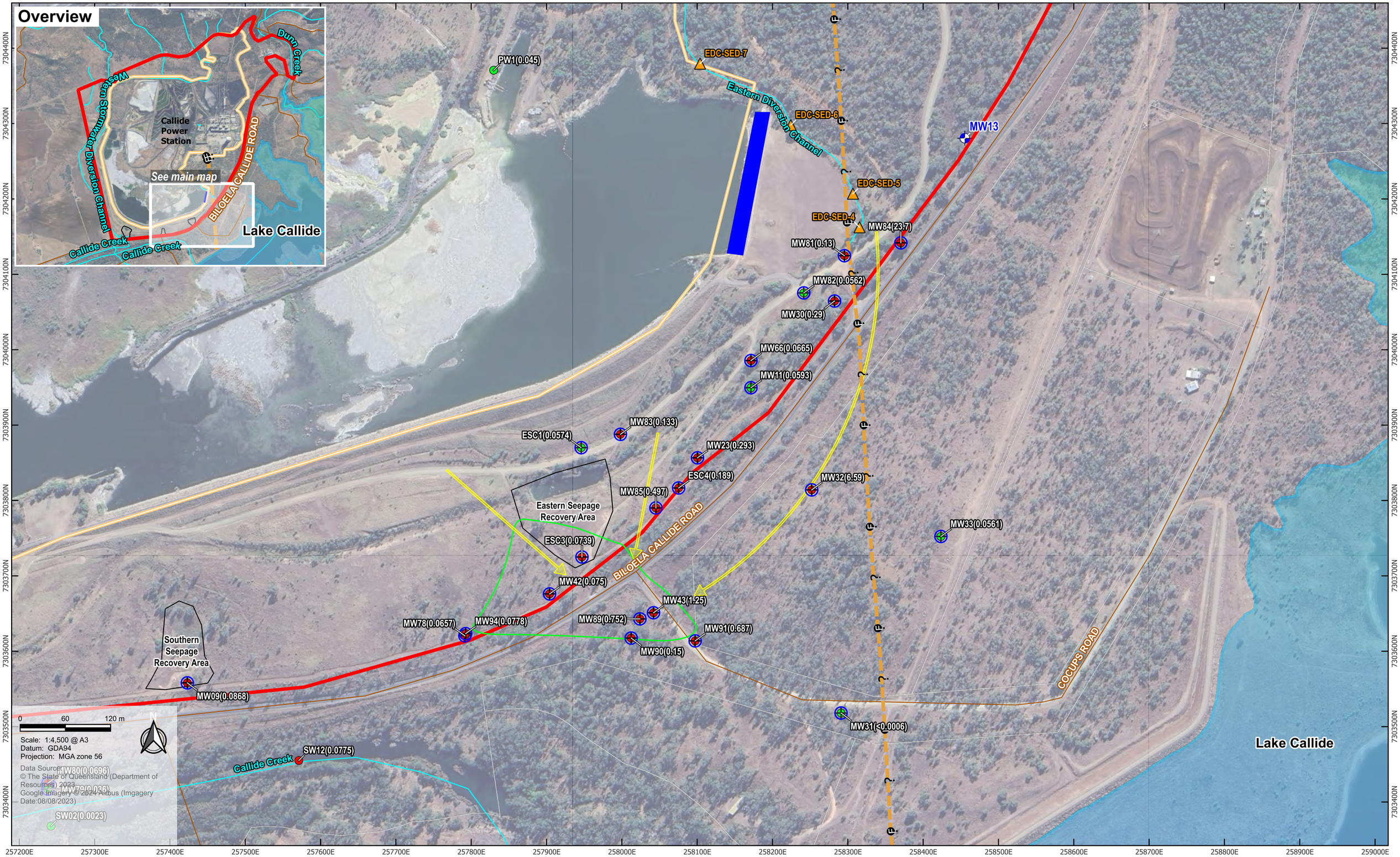
Legend

- Callide power station - site boundary
- Coal stockpile runoff pond catchment area
- Eastern stormwater management pond catchment area
- Wetlands catchment area
- Cadastre (DCDB)
- Ash Dam
- Potential area of connection between Northern Stormwater Pond and Ash Dam 2
- Roads and tracks
- Watercourses
- Release point
- Previous soil investigation location (Epic, 2022c)
- Soil investigation location
- Groundwater bores
- Surface water

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Figure F5
Callide A investigation locations



Legend

- Callide power station - site boundary
- Ash Dam B catchment area
- Lake Callide
- Spillway
- Cadastre (DCDB)
- Roads and tracks
- Watercourses
- Fault, inferred
- Inferred seepage pathways
- Approximate seepage recovery capture zone (EMS, 2024)
- Groundwater bores
- Sediment samples

CS Energy Monitoring Bore (up to 25 January 2024)

- Concentration below Australian Drinking Water Guideline for PFOS + PFHxS (0.07µg/L)
- Concentration above Australian Drinking Water Guideline for PFOS + PFHxS (0.07µg/L)

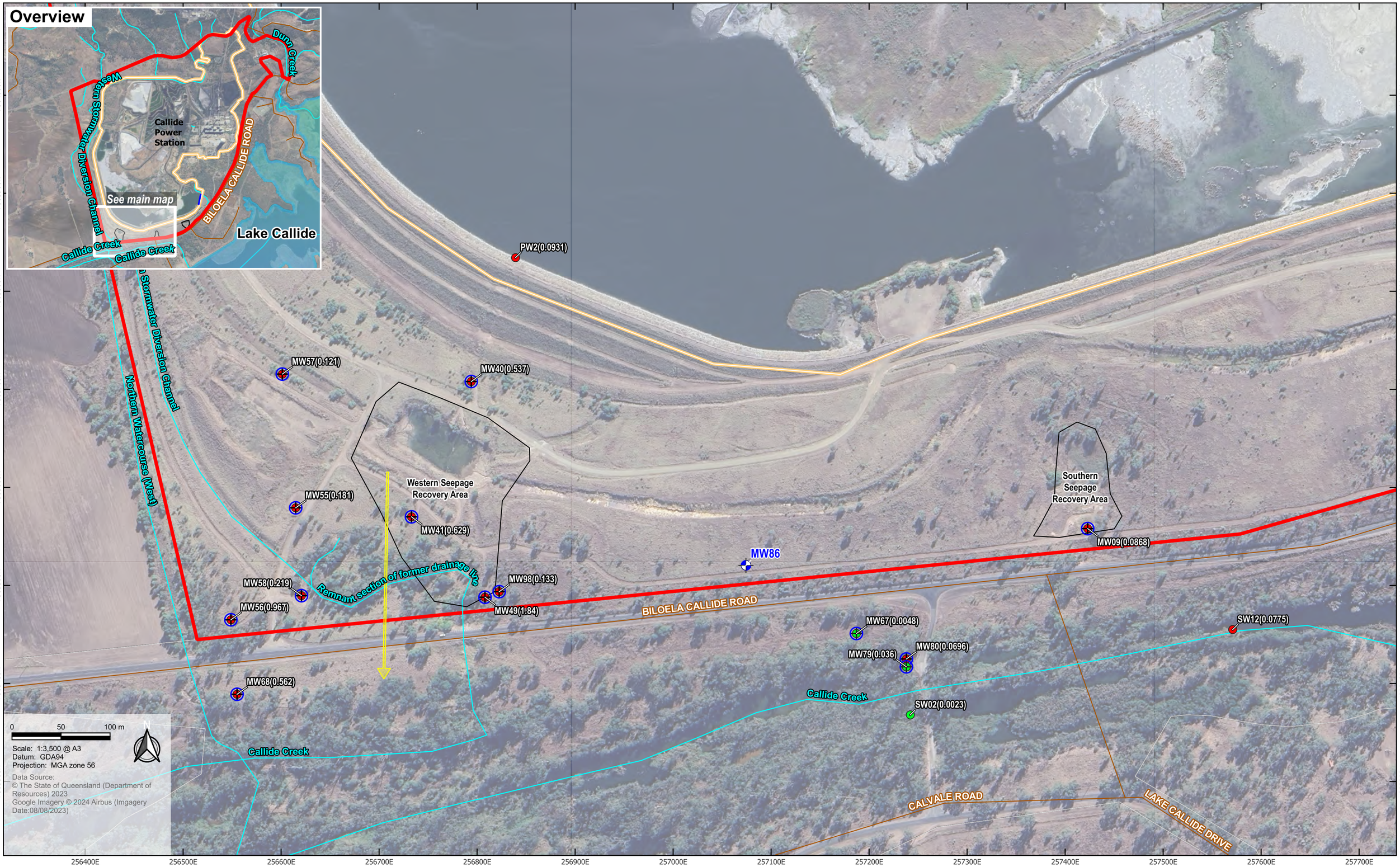
CS Energy surface water (up to 25 January 2024)

- Concentration below Australian Drinking Water Guideline for PFOS + PFHxS (0.07µg/L)
- Concentration above Australian Drinking Water Guideline for PFOS + PFHxS (0.07µg/L)

CS Energy
PFAS investigation (Callide Power Station)
Addendum Contaminated Land Investigation Document

Figure F6
Eastern seepage area

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Filepath: ~BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.03\Addendum Contaminated Land Investigation Document\Figure F7 Western seepage area.qgz

Legend

- Callide power station - site boundary
- Ash Dam B catchment area
- Cadastre (DCDB)
- Roads and tracks
- Watercourses
- Inferred seepage pathways
- Groundwater bores

CS Energy Monitoring Bore (up to 25 January 2024)

- Concentration below Australian Drinking Water Guideline for PFOS + PFHxS (0.07µg/L)
- Concentration above Australian Drinking Water Guideline for PFOS + PFHxS (0.07µg/L)

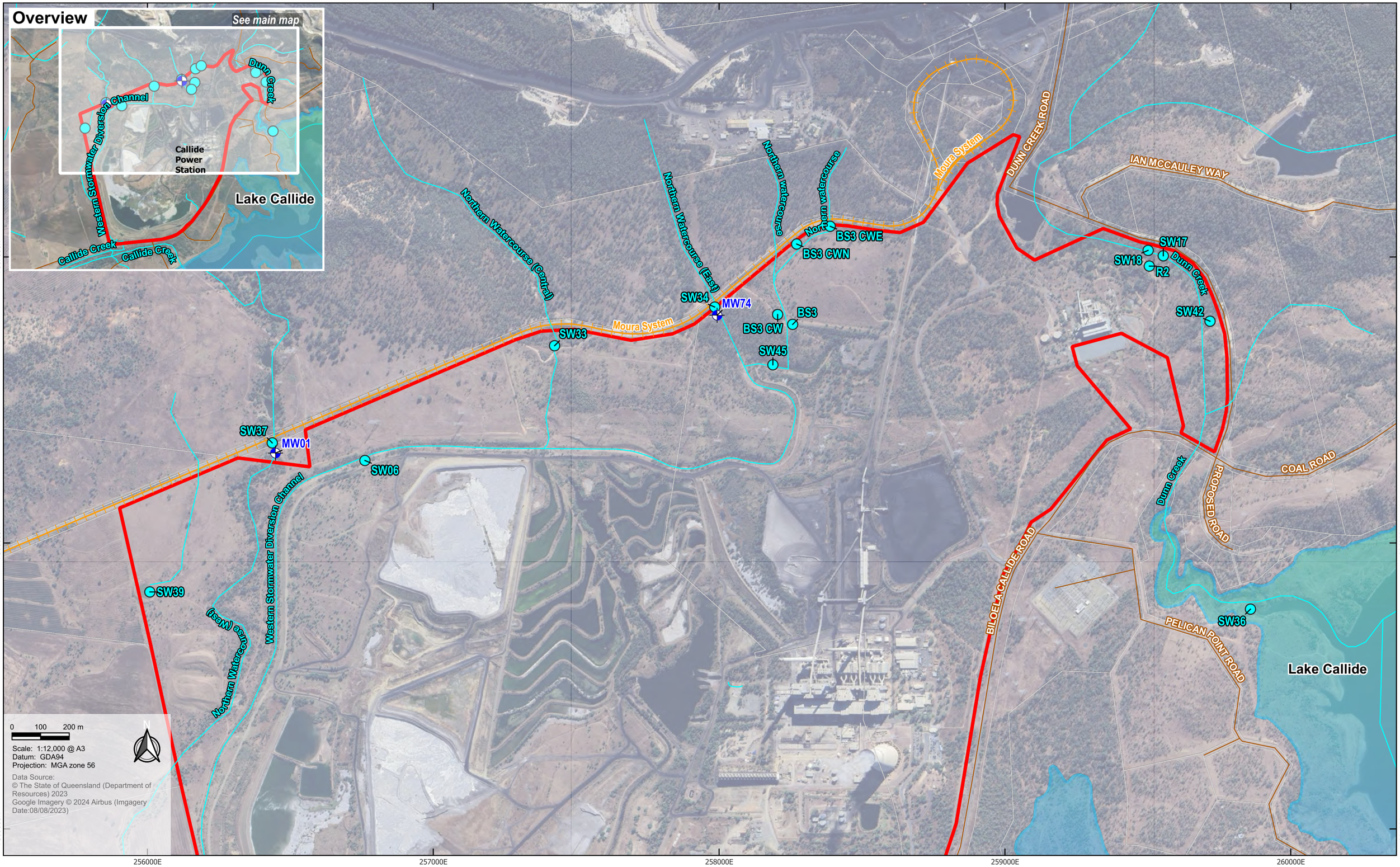
CS Energy surface water (up to 25 January 2024)

- Concentration below Australian Drinking Water Guideline for PFOS + PFHxS (0.07µg/L)
- Concentration above Australian Drinking Water Guideline for PFOS + PFHxS (0.07µg/L)

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PFAS investigation (Callide Power Station)
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Figure F7
Western seepage area



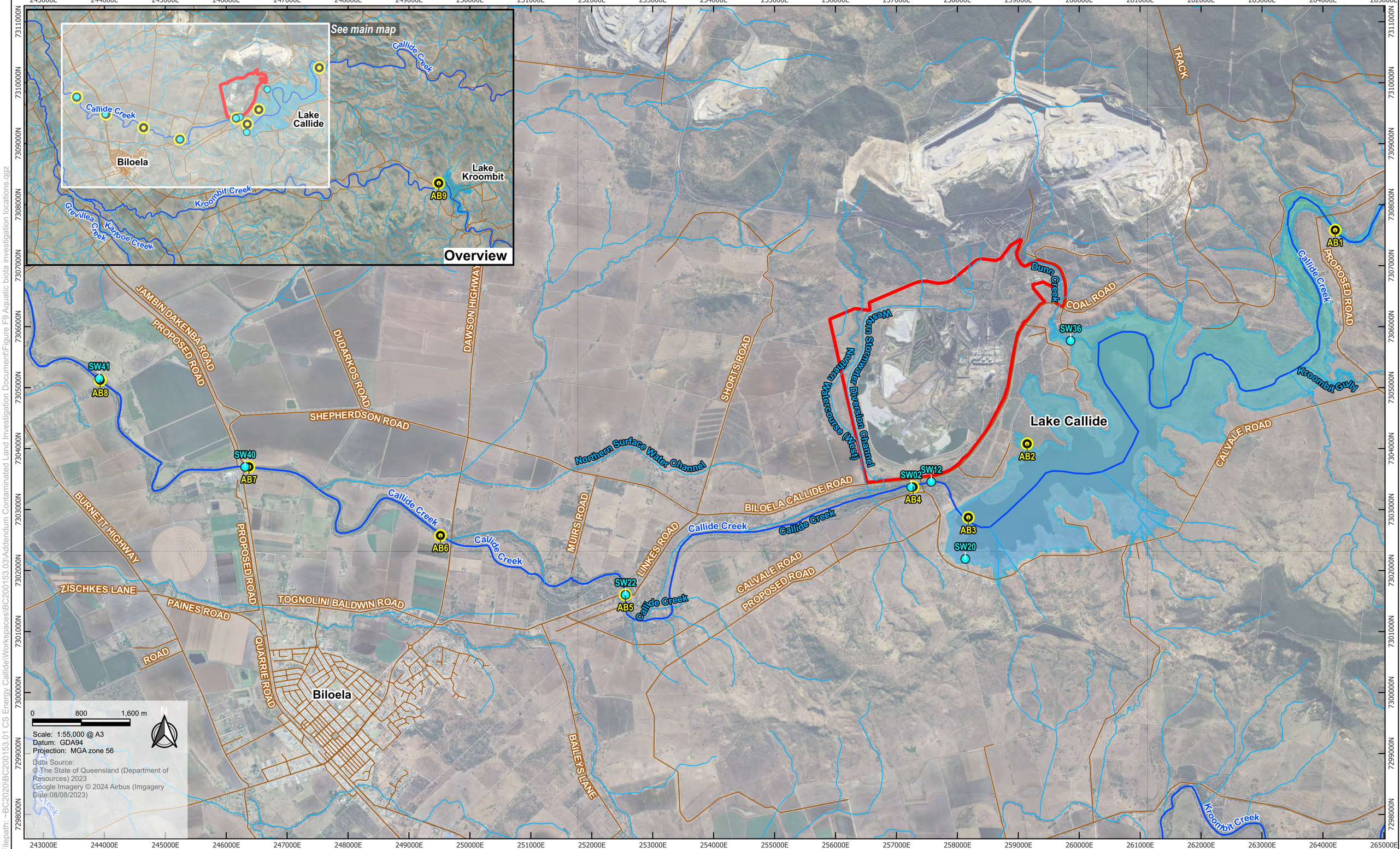
Legend

- Callide power station - site boundary
- Lake Callide
- Cadastre (DCDB)
- Railways
- Roads and tracks
- Watercourses
- Groundwater bores
- Surface water

CS Energy
PFAS investigation (Callide Power Station)
Addendum Contaminated Land Investigation Document

Figure F8
Northern boundary and Dunn creek monitoring locations

Filepath: ~BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.03\Addendum Contaminated Land Investigation Document\Figure F8 Northern boundary and Dunn creek monitoring locations.qgz



Filepath: ~BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.03\Addendum Contaminated Land Investigation Document\Figure F9 Aquatic biota investigation locations.qgz

Legend

- Callide power station - site boundary
- Lake Callide
- Cadastre (DCDB)
- Roads and tracks
- **Watercourses**
  - Major
  - Minor
- Surface water
- Aquatic biota sample locations

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CS Energy
PFAS investigation (Callide Power Station)
Addendum Contaminated Land Investigation Document

Figure F9
Aquatic biota investigation locations



Filepath: -BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.03\Addendum Contaminated Land Investigation Document\Figure F10 Field validation locations – Fuel oil tank.qgz

Legend

- Callide power station - site boundary
- Investigation area
- Roads and tracks

Final excavation surveyed extent

- Proposed remediation area
- Validation wall samples
- Investigation samples

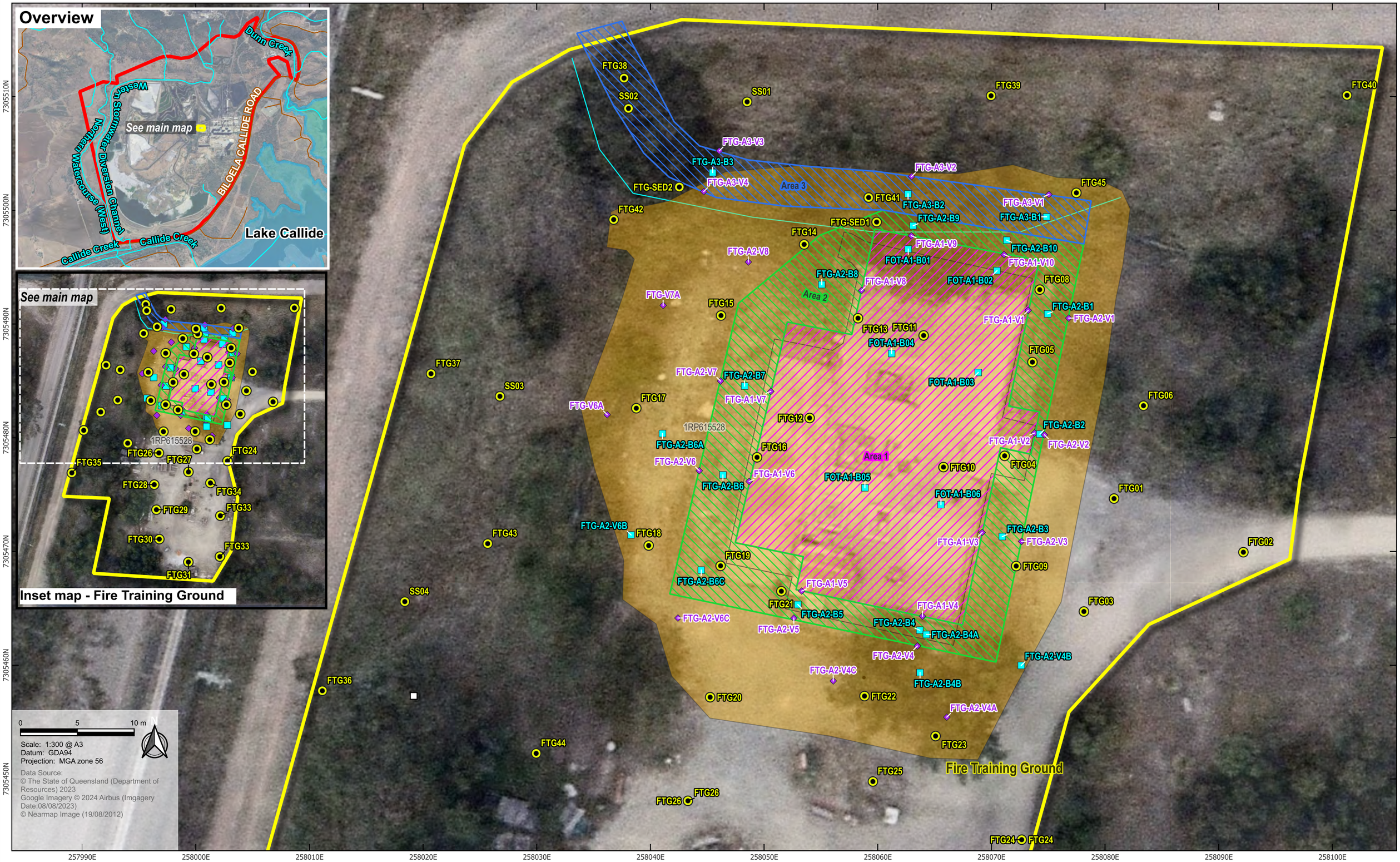
Final excavation surveyed extent

- Area 1
- Area 2
- Area 3
- Area 4

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PFAS investigation (Callide Power Station)
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Figure F10
Field validation locations – Fuel oil tank



Legend

- Callide power station - site boundary
- Investigation area
- Remediation extent (top of batter)

Proposed remediation area

- Area 1
- Area 2
- Area 3

- Watercourses
- Investigation samples
- Validation wall samples
- Validation floor samples

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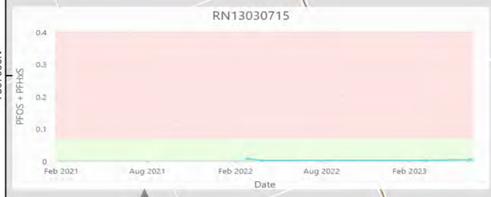
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PFAS investigation (Callide Power Station)
Addendum Contaminated Land Investigation Document

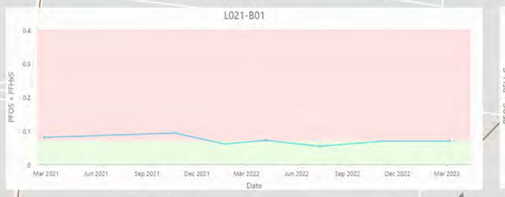
Figure F11
Field validation locations – Fire training ground

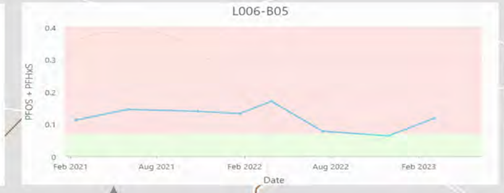
Filepath: ~BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.03\Addendum Contaminated Land Investigation Document\Figure F11 Field validation locations – Fire training ground.qgz

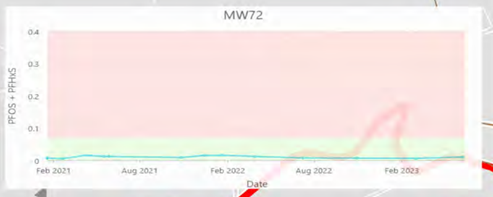
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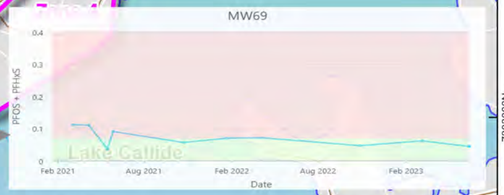






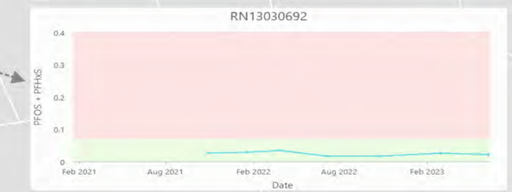
Callide Power Station





RN13030715
Zone 5
Zone 2
RN13030697
L021-B01
L006-B05
Zone 1
MW72
MW70
MW69
RN13030698
RN13030127
RN13030692
Zone 6
RN13030126
MW73
Zone 3
L005-B01
L012-B01
RN13030112







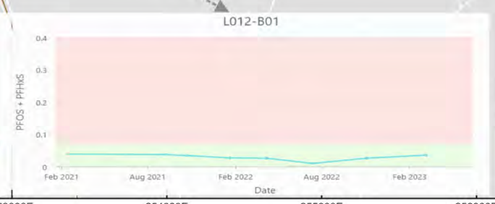
0 0.5 1 km

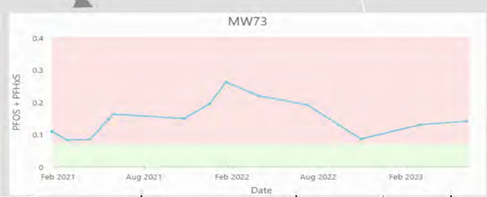
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Datum: GDA94
Projection: MGA zone 56

Data Source:
© State of Queensland (Department of Resources) 2022
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Legend

- Callide Power Station - site boundary
- Cadastre (DCDB)
- Lake Callide
- Roads and tracks
- Watercourses
- Groundwater Bores

Offsite investigation areas

- Zone 1 (Power Station to Muirs Road/Baileys Lane)
- Zone 2 (Muirs Road to Dawson Highway, north of Callide Creek)
- Zone 3 (Baileys Lane to Dawson Highway, south of Callide Creek)
- Zone 4 (Eastern Site Boundary to Lake Callide)
- Zone 5 (Dawson Highway to Jambin Dakenbah Road, north of Callide Creek)
- Zone 6 (Dawson Highway to Jambin Dakenbah Road, south of Callide Creek)

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Figure F12
Long-term Concentration Trend – Callide Creek Alluvium (sum of PFOS and PFHxS)

Filepath: -BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.03\Addendum Contaminated Land Investigation Document\Figure F12 Long-term Concentration Trend – Callide Creek Alluvium (sum of PFOS and PFHxS).qgz

PLATES



Plate P1. Groundwater Bore MW57 looking East

Groundwater monitoring bore in the Western Seepage Collection Area



Plate P2. Groundwater Bore MW76 looking East
Groundwater monitoring bore in ash upstream of Ash Dam B



Plate P3. Groundwater Bore MW82
Looking south towards the site boundary from the Ash Dam B spillway area



Plate P4. Groundwater Bore MW90
Looking north towards site and Ash Dam B



Plate P5. Groundwater Bore MW91
Looking southeast along Cocups Road



Plate P6. Groundwater Bore MW97
Looking southwest towards the dam wall of Ash Dam 2 (Callide A)



Plate P7. Ash Dam 2
Looking northwest along the base of the dam wall from MW97



Plate P8. View of the Drains Reclaim Dam (DRD)

Looking east from the DRD spillway



Plate P9. View of PW1
Looking south



Plate P10. View of surface water location PW2 with Ash Dam B
Looking north west



Plate P11. View of the Western Seepage Collection Pond and Pump
Looking southeast at surface water monitoring location SW03



Plate P12. View of SW28 monitoring location
Looking north from the southern site boundary



Plate P13. View of BS3 Monitoring Location
Looking east towards the v-notch weir (BS3)



Plate P14. View of SW34

Looking north towards the northern site boundary (culvert beneath railway line)



Plate P15. View of SW33
Looking north towards the northern site boundary



Plate P16. View of SW37

Looking north from north of the northern site boundary (adjacent to MW1)



Plate P17. View of Release Point R2 at Callide A
Looking east towards Dunn Creek



Plate P18. View of Callide A Eastern Stormwater Pond
Looking south west from surface water sampling location SW43



Plate P19. View of Callide A Northern Stormwater Pond
Looking east from surface water sampling location SW44



Plate P20. View of Callide A Northern Stormwater Pond Overflow Structure
Looking west into the NSP

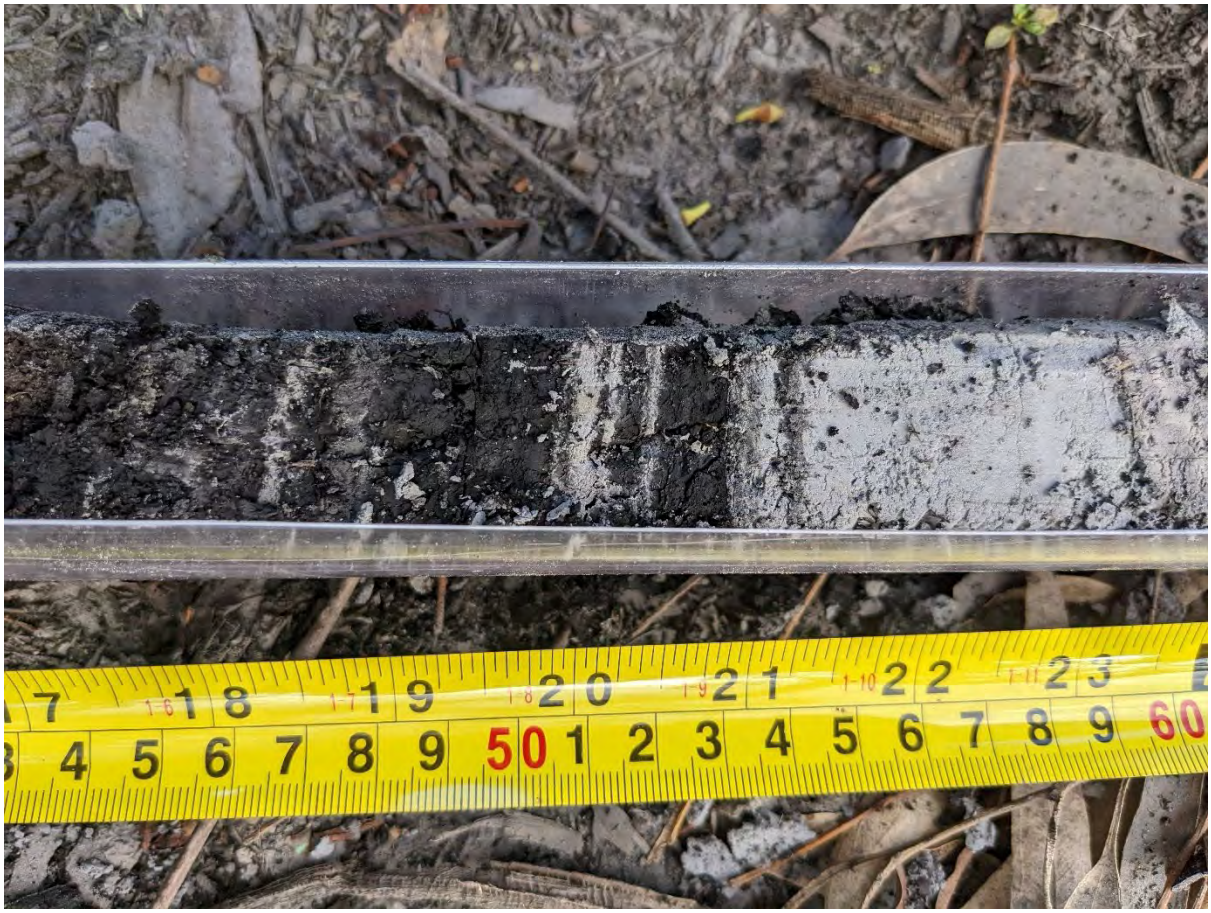


Plate P21. View of the soil profile encountered in soil bore CA15

Soil profile encountered at 0.5m depth from within the Callide A Northern Stormwater Pond



Plate P22. View of Callide A
Looking south from the Coal Hoppers



Plate P23. View of the Coal Hopper at Callide A
Looking north



Plate P24. View of the Fuel Oil Tanks
Looking northwest from the southeastern corner of the remediation area



Plate P25. View of the Fire Training Ground

Looking south from the northwestern corner of the fire training ground



Plate P26. View of the Fire Station

View of pole used for drying firefighting equipment



Plate P27. View of Ash Dam 4

Looking southeast towards the Coal Plant Slot Bunker (left) and Callide B and C Stations (right)



Plate P28. View of the perimeter drain at the Coal Plant
Looking west towards the coal plant and T1 coal conveyor

TABLES

Table T1. Groundwater and Surface Water Field Parameters
Table T2. Groundwater and Surface Water Analytical Results - PFAS
Table T3. Groundwater and Surface Water Analytical Results - Physico-Chemical, Cations & Anions
Table T4. Sediment Analytical Results - PFAS
Table T5. Soil Ash Analytical Results - PFAS
Table T6. Soil, Sediment and Ash Leachate Results
Table T7. Leachate Comparison
Table T8. PFAS Analytical Results Quality Assurance Review - Water Samples
Table T9. PFAS Analytical Results Quality Assurance Review - Solid Samples
Table T10. Soil Remediation and Validation Analytical Results
Table T11. Soil Remediation and Validation Analytical Results - Leachate

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T1: Groundwater and Surface Water Field Parameters

Sample ID	Sample Date	Field Description	Sample Method / Location	Total Depth	Standing Water Level (mBTOC)	Purge Time (min)	Purge Volume (L)	Temp (oC)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Redox Potential (mV)	Sample Observations	Other Notes
Bore X	09-Jul-22		DRY	8.99	-	-	0	0	-%	0	0	0	0		Dry
Bore X	14-Jun-23	Monitoring Bore	Hydrasleeve	9	2.96			22.9	40.8	3.39	17648	6.81	57.5		
BORROW-PIT-A	19-Jan-22	Former Borrow Pit	Northern Pit	-	-	-	0	31	244.50%	15.54	43343	8.06		Floating scum	CS Collected
BORROW-PIT-A	31-Mar-22	Former Borrow Pit	Northern Pit	-	-	-	0	28.3	-%	6.95	37885	7.62	58.4	Clear	
BORROW-PIT-A	12-Jul-22	Former Borrow Pit	Northern Pit	-	-	-	0	19.1	-%	5.88	34484	7.41	210.9	Clear	Weather: cool, overcast (90% cloud). Stream flow: still water body. Observed pollution: NIL. Some brown algae on water surface (<5%)
BORROW-PIT-A	26-Oct-22							32.5	76.20%	4.94	35186	7.69	32.8		
BORROW-PIT-A	27-Feb-23			0	0	0	0	0	0	0	0	0	0		DRY
BS3	06-Jul-22			-	-	-	-	11.1	-	6.66	257.3	7.8	113.1	Ponded, clear	Collected upstream of weir
Calide A NSP	01-Nov-22							31		2.68	122.2	7.3	105.8		
CALLIDE A ESP	20-Mar-21	Eastern Stormwater Pond	Eastern Stormwater Pond	-	-	-		30.1	122.10%	-	86.7	7.61	113.7		Sampled from waters edge
Callide A ESP	26-Oct-22							33.8	100.00%	7.13	215	7.85	55.2		
CALLIDE A NSP	20-Mar-21	Northern Stormwater Pond	Northern Stormwater Pond	-	-	-		26.6	5.00%	-	143.9	6.01	41.1		Sampled from waters edge
DRD	20-Jan-22	DRD	Sampled from weir	-	-	-	0	31.6	198.00%	15.02	9360	9.03		Turbid, algae and strong odour	CS Collected
DRD	13-Jul-22		Sample collected from eastern side of wall	-	-	-	0	20.9	-%	8.48	7906	8.03	116.7	Grey, turbid	Weather: sunny cool. Stream flow: still water boday. Pollution: ash on surface around sampling location.
DRD	27-Oct-22							29.8	100.00%	10.96	9576	7.84	111.7		
DRD	28-Feb-23							27.5	52	3.93	11480	7.93	80.8		
DRD	06-Jun-23							21.7	100	9.59	5989	8.57	56.4		
DRD	04-Sep-23							25.6	85.1	6.74	11398	8.68	37.7		
DRD	05-Dec-23							32.6	96.9	6.82	4384	8.42	17.9		
DRD		DRD	Sampled from weir	-	-	-	0	27.4	-%	5.07	10830	8.2	54	Green/brown	
DRD FILL POINT	23-Mar-21	Fill point at DRD	Fill point at DRD	-	-	-		28.4	109.50%	-	6322	8.46	97.1		
ESC1	20-Jan-21	Hydrosleeve	Hydrasleeve	27.00	6.15		0	26.5	29.60%	-	7128	7.38	76.7		
ESC3	20-Jan-21	Hydrosleeve	Hydrasleeve	23.00	14.06		0	27.4	17.00%	-	8976	7.22	18.6		
ESC3	20-Jan-22	Monitoring Bore	Hydrasleeve	23.79	9.42	0		24.1	-%	0.9	8895	6.97	-99.7	Pale Black, Strong sulfuric odour	
ESC3	01-Apr-22	Monitoring Bore	Pump	23.63	11.93		120	24	-%	1.35	7406	6.92	6.8	Clear	
ESC3	09-Jul-22		Submersible Pump	23.90	12.4		120	24.1	-%	0	9028	6.7	108.9	Clear	
ESC3	28-Oct-22	Monitoring Bore	Submersible	23.73	12.62	-	160	24.2	0.00%	0	8405	6.88	33.5		
ESC3	02-Mar-23	Monitoring Bore	Submersible	23.9	5.94		180	23.7	0	0	8627	7	-10		
ESC3	08-Jun-23	Monitoring Bore	Submersible	20.4	6.23		140	23.4	0	0	8931	6.97	-77.3		
ESC3	06-Dec-23	Monitoring Bore	Submersible		7.11		100	24	0.1	0.01	9440	7.11	0.5		
ESC4	02-Apr-22	Monitoring Bore	Hydrasleeve	23.77	5.27		0	24	-%	1.78	8017	7.12	87	Clear	
ESC4	09-Jul-22		Submersible Pump	23.84	6.46		180	24.3	-%	0	8468	6.61	-3.2	Clear, Slight H2S	
ESC4	27-Oct-22	Monitoring Bore	Hydrasleeve	23.9	6.33	-	0	29.4	10.90%	0.8	8386	7.7	-2.4		
ESC4	03-Mar-23	Monitoring Bore	Hydrasleeve	23.93	6.49		0	26.2	4.5	0.35	8220	6.97	65.1		
ESC4	12-Jun-23	Monitoring Bore	Hydrasleeve	23.9	6.89			23.5	15	1.24	8237	7.02	-24.6		
ESC4	06-Sep-23	Monitoring Bore	Hydrasleeve		7.16			24.5	11.4	0.93	8731	6.97	53.4		
ESC4	07-Dec-23	Monitoring Bore	Hydrasleeve		7.26		0	31.7	13.7	1.02	9284	7.6	-21.5		
ESP	19-Jan-22	Callide A ESP	Callide A Stormwater Pond	-	-	-	0	29.8	65.40%	4.82	136.5	7.08		Clear	ORP not working and DO% out of calibration
EVAP FILL POINT	23-Mar-21	Fill point at Evap Ponds	Fill point at Evap Ponds	-	-	-		31.4	81.20%	-	12795	6.55	143.5		
KROOMBIT DAM	15-Sep-22	h from spillway discharge from dam		1.2	-	-	-	20.9	67.4	6.01	547	8.03	-	Flowing clear	Completed with CS WQM
L005-B01	21-Jan-22	Domestic		-		15		23.3	-%	1.92	2246	6.67	27.7	Clear	
L005-B01	05-Apr-22	Extraction	Submersible	-		15		28.5	-%	3.56	2187	7.37	89.3	Clear	
L005-B01	14-Jul-22	Domestic		-		10		18.8	-%	5.19	1817	7.36	163.9	Clear	
L005-B01	27-Oct-22	Domestic		-	-	10		25	57.10%	4.62	1689	7.1	129.7		
L005-B01	07-Mar-23	Domestic				10		26.6	67.6	5.53	2067	7.35	61.3		
L005-B01	13-Jun-23	Domestic				10		22.4	64.8	5.58	1957	7.32	31.2		
L005-B01	07-Sep-23	Domestic				10		27.1	59.8	4.75	2184	7.31	46.3		
L005-B01	12-Dec-23	Domestic					10	26.9	52.6	4.19	2149	7.4	7		
L005-B01		Domestic		-		15		24.7	39.60%	-	2093	6.63	153.7	Clear	Test Tap

Epic File: BC200153.03
Site: Callide Power Station
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Report Date Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

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Sample ID	Sample Date	Field Description	Sample Method / Location	Total Depth	Standing Water Level (mBTOC)	Purge Time (min)	Purge Volume (L)	Temp (oC)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Redox Potential (mV)	Sample Observations	Other Notes
L006-B01	01-Jun-21			-		15		0	-%	0	0	0	0		
L006-B05	21-Jan-22	Stockwater		-		15		24.1	-%	1.05	5889	5.94	25.4	Clear	
L006-B05	29-Mar-22	Extraction		-		15		25.8	-%	4.71	1886	6.5	33.8	Cloudy	
L006-B05	14-Jul-22	Stockwater		-		10		15	-%	4.52	1286	7.14	146.4	Clear	
L006-B05	01-Nov-22	Stockwater		-	-	10		24.1	66.90%	5.64	1560	7.06	70.7		
L006-B05	04-Mar-23	Stockwater				10		28.9	38.4	2.98	1777	6.66	33.2		
L006-B05	07-Jun-23	Stockwater				10		22	61.9	5.36	2756	6.57	79.8		
L006-B05	05-Sep-23	Stockwater				10		25.6	56	4.54	4394	6.57	66.8		
L006-B05	08-Dec-23	Stockwater				10		29	47.7	3.63	3093	6.68	46.8		
L006-B05		Stockwater		-		15		24.9	39.40%	-	654	6.86	35.8	Clear/Cloudy	Diversion valve with poly pipe elbow (Plumbers tape)
L012-B01	07-Sep-21	Garden Tap		-		15		24.5	24.70%	0	1496	6.51	206.7	Clear	Side tap installed by Barry with green garden hose
L012-B01	20-Jan-22	Garden Tap		-		15		23.3	-%	1.09	1720	5.79	26.8	Clear	
L012-B01	05-Apr-22	Monitoring Bore	Submersible	-		15		24.8	-%	1.37	1672	6.58	93.1	Clear	
L012-B01	12-Jul-22	Garden Tap		-		10		19.5	-%	1.67	1705	6.99	128.5	Clear	
L012-B01	03-Nov-22	Garden Tap		-	-	10		22.2	8.00%	0.71	1365	6.42	144.4		Bore operated by landholder (Barry Cooper), sample taken from hose connected to bore tap
L012-B01	08-Mar-23	Garden Tap				10		26.3	11.8	0.95	1278	6.55	86.5		
L012-B01	14-Jun-23	Garden Tap				10		22.8	18.1	1.57	1260	6.68	22.6		
L012-B01	08-Sep-23	Garden Tap				10		24.3	30	2.48	1274	6.63	87.5		
L012-B01	11-Dec-23	Garden Tap				10		24.9	23.4	1.96	1322	7.32	-14		
L012-B01		Pump Gauge		-		20		25.4	7.90%	-	1344	6.57	135.6	Clear	Pressure Gauge, BD/SD04
L021-B01	03-Nov-22	Garden Tap		-	-	10		24.6	31.40%	2.61	443.7	6.63	146.7		
L021-B01	06-Mar-23	Garden				10		27	28.2	2.26	560	6.91	65.1		
L021-B01	12-Jun-23	Garden				10		26.3	37.4	3.02	626	6.73	48.1		
L021-B01	07-Sep-23	Garden				10		30.5	24.3	1.8	784	6.62	47.4		
L021-B01	08-Dec-23	Garden				10		31.3	36.2	2.76	724	7.43	17.3		
L021-G01	20-Jan-22	Garden		-		15		24.1	-%	5.15	374	6.7	41.2	Clear	
L021-G01	05-Apr-22	Monitoring Bore	Submersible	-		15		24.9	-%	3.97	444.3	7.05	95.7	Clear	
L021-G01	12-Jul-22	Garden		-		10		19	-%	3.52	469.6	7.01	115.7	Clear	
L021-G01		Garden		-		20		25.1	50.40%	-	382.3	6.96	156.9	Clear	BD06/SD06
MW01	07-Apr-21	Monitoring Bore	Pump	27.85	5.73		28	22.6	-%	2.02	23765	6.47	38.4	Clear	
MW01	06-Apr-22	Monitoring Bore	Pump	27.85	13.06		60	23.3	-%	1.02	24094	6.34	6.3	Grey	
MW01	13-Jul-22	Monitoring Bore	Low-flow	27.78	1.54		50	0	-%	0	0	0	0		No Sample - Pump issue
MW01	03-Nov-22	Monitoring Bore	Hydrasleeve	-	2.12	-	0	23.7	11.00%	0.85	22711	6.26	93		
MW01	02-Mar-23	Monitoring Bore	Hydrasleeve		1.54		0	25.5	7.1	0.53	21775	6.52	-21.1		
MW06	14-Jun-23	Monitoring Bore	Hydrasleeve	7.5	2.3			23.4	22.3	1.81	18843	6.7	61.4		
MW09	20-Jan-21	Monitoring Bore	Hydrasleeve	10.00	6.11		0	25.8	28.30%	-	11542	7.12	-8.3		
MW09	20-Jan-22	Monitoring Bore	Hydrasleeve	10.17	4.74	0		24.9	-%	1.04	13709	6.63	44.5	Cloudy pink	
MW09	03-Apr-22	Monitoring Bore	Submersible	10.18	8.74		40	24.9	-%	37.8	12759	6.73	37.8	Clear	
MW09	09-Jul-22	Monitoring Bore	Submersible Pump	10.21	6.33		55	25.4	-%	0.25	15836	6.45	103.9	Clear	
MW09	03-Nov-22	Monitoring Bore	Submersible	10.15	6.28	-	15	25.4	7.50%	0.61	14685	6.61	67.4		
MW09	03-Mar-23	Monitoring Bore	Submersible	10.24	7.18		4	25.1	9.1	0.72	11554	6.82	-26		
MW09	08-Jun-23	Monitoring Bore	Submersible	10	7.2		3	24.5	9.2	0.75	10935	6.81	62.8		
MW09	06-Sep-23	Monitoring Bore	Submersible		7.07		6	25	1.1	0.09	11686	6.83	-111		
MW09	07-Dec-23	Monitoring Bore	Submersible		7.38		16	26	8.8	0.7	11026	5.37	79.8		pH and Redox Issues with YSI
MW11	01-Apr-22	Monitoring Bore	Submersible	8.36	3.8		60	24	-%	0.02	7692	6.83	-30	Clear	
MW11	09-Jul-22	Monitoring Bore	Submersible	8.41	4		80	23.9	-%	0	9031	6.68	48.2	Clear	
MW11	28-Oct-22	Monitoring Bore	Submersible	8.39	3.57	-	60	23	0	0	9027	6.87	-23		
MW11	02-Mar-23	Monitoring Bore	Submersible	8.37	3.77		50	22.8	1	0.08	8832	6.95	-30.9		
MW11	08-Jun-23	Monitoring Bore	Submersible	8	4.72		80	23.2	0	0	8688	6.95	-102.3		
MW13	28-Feb-21	Monitoring Bore	DRY	7.79	-	-	0	0	-%	-	0	0	0		
MW13	01-Apr-22	Monitoring Bore	DRY	-	-	-	0	0	-%	0	0	0	0		
MW13	09-Jul-22	Monitoring Bore		-	7.16		0	0	-%	0	0	0	0		Too low to sample
MW13	28-Oct-22	Monitoring Bore	Submersible	7.8	6.93	-	0	-	-	-	-	-	-		Insufficient water column for pumping
MW13	03-Mar-23	Monitoring Bore	Submersible	7.85	6.97	0	0	0	0	0	0	0	0		Not enough water column to pump
MW18	28-Feb-21	Monitoring Bore	DRY	-	-	-	0	0	-%	-	0	0	0		

Epic File: BC200153.03
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Report Date Mar-24

Epic Environmental Pty Ltd
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Sample ID	Sample Date	Field Description	Sample Method / Location	Total Depth	Standing Water Level (mBTOC)	Purge Time (min)	Purge Volume (L)	Temp (oC)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Redox Potential (mV)	Sample Observations	Other Notes
MW19	28-Feb-21	Monitoring Bore	DRY	-	-	-	0	0	-%	-	0	0	0		
MW21	28-Feb-21	Monitoring Bore	DRY	-	-	-	0	0	-%	-	0	0	0		
MW23	06-Mar-23	Monitoring Bore	Submersible	13.53	5.51		80	24.3	0	0	218	6.88	104.8		
MW26	14-Jun-23	Monitoring Bore	Hydrasleeve	15	3.92			23.2	20.2	1.68	8785	7.04	50.6		
MW27	21-Jan-21	Monitoring Bore	Hydrasleeve	22.00	7.69		0	25	15.00%	-	19191	6.96	152.9		
MW27	14-Jun-23	Monitoring Bore	Hydrasleeve	22	7.24			25.1	31.3	2.41	20748	6.84	44.8		
MW30	01-Apr-22	Monitoring Bore		8.90	5.14		60	25.2	-%	0.02	2912	6.48	-21.6	Clear	
MW30	09-Jul-22	Monitoring Bore	DRY	9.01	-	-	0	0	-%	0	0	0	0		DRY
MW30	28-Oct-22	Monitoring Bore	Submersible	8.93	5.01	-	6	26	12.80%	0.99	2803	6.56	18.9		
MW30	03-Mar-23	Monitoring Bore	Submersible	0	0	0	0	0	0	0	0	0	0		Collapsed, couldn't get pump down well
MW31	28-Feb-21	Monitoring Bore	Hydrasleeve	13.03	6.32		0	25.1	17.30%	-	5080	7.07	131	Clear	
MW31	20-Jan-22	Monitoring Bore	Hydrasleeve	13.08	5.95		0	24.7	-%	2.59	1109	6.7	-4.3	Clear	
MW31	01-Apr-22	Monitoring Bore	Submersible	13.90	6.37		100	25.1	-%	0.2	3912	6.87	10		
MW31	08-Jul-22	Monitoring Bore	Submersible	13.22	5.75		80	24.4	-%	0	2824	6.89	63.4	Clear	
MW31	28-Oct-22	Monitoring Bore	Submersible	13	5.91	-	14	26.5	11.30%	0.9	3910	6.89	26.6		
MW31	04-Mar-23	Monitoring Bore	Submersible	13.15	5.41		80	25.2	0	0	1982	7.3	-25.8		
MW31	09-Jun-23	Monitoring Bore	Submersible	13.2	6.35		5	24.4	4.2	0.36	3098	7.05	-152.2		
MW31	08-Dec-23	Monitoring Bore	Submersible		6.7		14	25.7	0	0	4756	7.41	-152.2		
MW32	28-Feb-21	Monitoring Bore	Hydrasleeve	25.57	16.55		0	25.5	9.00%	-	5078	6.55	158.3	Cloudy	
MW32	20-Jan-22	Monitoring Bore	Hydrasleeve	25.73	14.8		0	26.8	-%	1.05	6805	6.2	-104.7	Cloudy black, sligh sulfuric odour	
MW32	30-Mar-22	Monitoring Bore	Pump	25.38	15.4		120	26	-%	0.41	6082	6.31	14.3	Clear	
MW32	08-Jul-22	Monitoring Bore	Submersible	25.83	15.91		7	24.1	-%	2.8	6758	6.33	88.7	Milky (clearing)	Low flow due to heat
MW32	28-Oct-22	Monitoring Bore	Hydrasleeve	25.64	15.45	-	0	30.5	10.30%	0.77	738.1	6.31	59.7		Couldn't pump, swapped to hydrasleeve
MW32	04-Mar-23	Monitoring Bore	Submersible	26	15.51		8	26.5	4.3	0.36	6376	6.47	-57.5		
MW32	10-Jun-23	Monitoring Bore	Submersible	25	16.38		5	25.5	17.2	1.38	6488	6.54	-120.7		
MW32	07-Sep-23	Monitoring Bore	Submersible		16.74		7	25.6	27	2.17	6595	6.51	-50.1		
MW32	08-Dec-23	Monitoring Bore	Submersible		16.9		9	28	6.4	0.48	6457	6.54	-79.5		
MW33	28-Feb-21	Monitoring Bore	Hydrasleeve	-	19.04		0	24.8	6.30%	-	1730	7.14	-20.8	Cloudy	Hydrosleeve Sits @ 35.36m
MW33	12-Dec-23	Monitoring Bore	Hydrasleeve	41	20.16		0	23.7	8.4	0.64	4351	6.34	-60.2		Hydrasleeve dropped 11/12/23, YSI Issues with pH/Redox
MW40	20-Feb-21	Monitoring Bore	Hydrasleeve	18.43	5.62		0	25.1	54.10%	-	9639	7.54	132.5	Cloudy Brown	SWL @5.62/18.43
MW40	21-Jan-22	Monitoring Bore	Hydrasleeve	18.30	4.25	0		23.9	-%	0.75	8344	6.24	102.3	Cloudy brown	
MW40	01-Apr-22	Monitoring Bore	Hydrasleeve	18.37	4.93		0	23.8	-%	1.55	7408	6.87	24.5	Cloudy, slight hydrogen sulfide smell	
MW40	13-Jul-22	Monitoring Bore	Hydrasleeve	18.53	4.74		0	0	-%	0.97	9354	6.98	129.2	Clear	Odour: Slight H2S
MW40	27-Oct-22	Monitoring Bore	Hydrasleeve	18.4	4.69	-	0	26.6	34.10%	2.7	8718	6.95	-43.9		
MW40	01-Mar-23	Monitoring Bore	Hydrasleeve	18.35	4.97		0	29.4	4.6	0.34	8132	6.86	30.1		
MW40	12-Jun-23	Monitoring Bore	Hydrasleeve	18.42	5.5			24.5	10.9	0.91	7950	6.83	-11.9		
MW40	06-Sep-23	Monitoring Bore	Hydrasleeve		5.46			25.3	12.4`	0.99	8532	6.84	-10.8		
MW40	06-Dec-23	Monitoring Bore	Hydrasleeve		6.03		0	26.8	25.9	2.02	8392	7.12	11.9		Hydrasleeve
MW41	21-Jan-21	Monitoring Bore	Hydrasleeve	20.00	8.67		0	25.7	15.30%	-	11929	7.21	92.4		
MW42	28-Feb-21	Monitoring Bore	Hydrasleeve	25.70	12.84		0	25.2	8.60%	-	8183	6.98	154.2	Slight pink, Cloudy	
MW42	12-Jun-23	Monitoring Bore	Submersible	25	9.4		160	24.5	0	0	9542	6.93	5.1		
MW42	06-Sep-23	Monitoring Bore	Submersible		10.24		150	24.6	1	0.08	9910	6.92	-93.6		
MW42	07-Dec-23	Monitoring Bore	Submersible		12.69		140	25	1.1	0.09	10094	6.99	-42.1		
MW43	20-Jan-21	Monitoring Bore	Hydrasleeve	30.40	11.16		0	26.5	29.60%	-	5716	7.15	41.9		
MW43	20-Jan-22	Monitoring Bore	Hydrasleeve	30.86	8.43		0	24.2	-%	1.51	6084	6.32	-160	Cloudy pink, strong sulfuric odour	
MW43	03-Apr-22	Monitoring Bore	Submersible	30.45	8.6		240	25.9	-%	0.44	6438	6.58	-25.6	Clear	
MW43	10-Jul-22	Monitoring Bore	Submersible	30.88	9.65		16	21.7	-%	2.19	6340	6.6	-0.3	Clear	Odour: Slight H2S
MW43	29-Oct-22	Monitoring Bore	Submersible	30.54	10.17	-	12	29.4	7.90%	0.6	6525	6.6	-184.1		
MW43	03-Mar-23	Monitoring Bore	Submersible	31	7.77		6	25.4	13.9	1.18	7010	6.72	-99.3		

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MW43	09-Jun-23	Monitoring Bore	Submersible	30.4	8.1		5	25	31.7	2.58	7108	6.75	-142.1		
MW43	07-Sep-23	Monitoring Bore	Submersible		8.71		7	24.5	24.6	2.01	7066	6.71	-101.7		
MW43	08-Dec-23	Monitoring Bore	Submersible		11.36		10	26.3	8.9	0.7	7154	6.89	-163.3		
MW46	02-Mar-21	Monitoring Bore	Hydrasleeve	20.49	9.4		0	25.3	9.90%	-	10862	6.8	93.1	Clear	2/3 1100
MW49	21-Jan-21	Monitoring Bore	Hydrasleeve	18.10	9.27		0	25	14.20%	-	15616	7.12	124.6		
MW49	20-Jan-22	Monitoring Bore	Hydrasleeve	18.72	7.35		0	25.1	-%	1.36	420	6.18	46.6	Pale black	
MW49	01-Apr-22	Monitoring Bore	Hydrasleeve	18.92	8.94		0	23.3	-%	1.51	15983	6.75	41.6	Cloudy Pink	
MW49	12-Jul-22	Monitoring Bore	Hydrasleeve	18.90	7.59		0	20	-%	0.95	16026	6.66	136	Clear	Odour: Slight H2S
MW49	27-Oct-22	Monitoring Bore	Hydrasleeve	19	8.54	-	0	26.8	13.30%	1.01	17703	6.72	-31.2		
MW49	03-Mar-23	Monitoring Bore	Hydrasleeve	18.98	8.88		0	25.4	22.1	1.76	16035	6.78	-28		
MW49	12-Jun-23	Monitoring Bore	Hydrasleeve	18	9.36			24.5	22.3	1.97	14419	6.75	-47.2		
MW49	06-Sep-23	Monitoring Bore	Hydrasleeve		9.3			25.3	7.9	0.62	14016	6.75	-64		
MW49	06-Dec-23	Monitoring Bore	Hydrasleeve		9.7		0	28.1	8.2	0.72	13095	7.16	-50.5		Hydrasleeve
MW55	20-Feb-21	Monitoring Bore	Tap Out	-		10		24.8	57.40%	-	11552	7.12	158.4	Clear	
MW56	20-Feb-21	Monitoring Bore	Tap Out	-		10		24.2	70.50%	-	92150	6.91	333.5	Cloudy	No Odour
MW56	20-Jan-22	Monitoring Bore	Tap Out	-	-	-	15	23.6	-%	4.56	10189	6.36	251	Pale yellow, slight chlorine odour	
MW56	01-Apr-22	Monitoring Bore	Tap Out	-	-	-	0	25.1	-%	3.41	9188	6.79	70.2	Clear	
MW56	10-Jul-22	Monitoring Bore	Tap Out	-	-	-	0	23.7	-%	3.59	10427	6.64	116.4	Clear	Odour: strong salty
MW56	02-Nov-22	Monitoring Bore	Tap Out	-	-	10		25.1	60.20%	4.7	9756	6.98	537.3		
MW56	03-Mar-23	Monitoring Bore	Tap out			0	0	0	0	0	0	0	0		Dry
MW56	10-Jun-23	Monitoring Bore	Tap Out												Not Operational
MW56	05-Sep-23	Monitoring Bore	Tap Out												Not operational
MW56	05-Dec-23	Monitoring Bore	Tap			10		29.5	63.1	4.68	10085	7.31	476.3		
MW57	20-Feb-21	Monitoring Bore	Tap Out	-		10		24.2	63.90%	-	13717	7	469	Yellow, Clear	No Odour
MW58	20-Feb-21	Monitoring Bore	Tap Out	-		15		23.6	49.40%	-	10450	6.9	90.2	Clear	Sulfuric Odour
MW59	14-Jun-23	Monitoring Bore	Hydrasleeve	15	5.57			24.2	36.5	2.97	10471	7.45	36.2		
MW59	09-Sep-23	Monitoring Bore	Hydrasleeve		5.66			22.3	24.4	2.05	10431	7.57	80.3		
MW59	07-Dec-23	Monitoring Bore	Hydrasleeve		5.76		0	25.3	38.9	3.14	10561	7.68	-12.4		
MW60	13-Jul-22	Monitoring Bore	Hydrasleeve	48.70	4.7		0	22.9	-%	0.59	26274	6.61	143.6	Slight Ash/Sed	
MW60	14-Jun-23	Monitoring Bore	Hydrasleeve	50	4.82			24.8	17.2	1.32	23308	6.65	54.9		
MW66	02-Apr-22	Monitoring Bore	Pump	13.33	4.48		180	24	-%	0.03	8271	6.92	-13.5	Clear	
MW66	09-Jul-22	Monitoring Bore	Submersible	13.41	4.72		140	23.5	-%	0	8936	6.75	105.8	Clear	
MW66	06-Mar-23	Monitoring Bore	Submersible	13.35	4.5		90	24	0	0	214	7.03	-19.8		
MW67	08-Apr-21	Monitoring Bore	Hydrasleeve	20.98	9.61		0	27.1	29.00%	-	2584	7.17	120.5		
MW67	17-Dec-21	Monitoring Bore	Hydrasleeve	12.10	9.03		0	26.5	-%	1.41	4438	6.63	103.2	Cloudy	CS Collected
MW67	21-Jan-22	Monitoring Bore	Hydrasleeve	20.64	9.03	0		24	-%	1.45	4389	6.19	-14.6	Cloudy dark brown	
MW68	19-Jan-21	Monitoring Bore	Hydrasleeve	17.42	9.5		0	31.9	37.90%	-	10756	6.8	113.6		
MW68	20-Feb-21	Monitoring Bore	Hydrasleeve	17.20	9.48		0	23.7	3180.00%	-	8161	7.42	105	Cloudy	SWL@9.48/17.20
MW68	08-Apr-21	Monitoring Bore	Hydrasleeve	17.48	9.02		0	26.1	19.80%	1.31	8888	6.86	110.7		
MW68	17-Dec-21	Monitoring Bore	Hydrasleeve	17.04	8.43		0	24.3	-%	1.32	8703	6.8	143.1	Cloudy	CS Collected
MW68	19-Jan-22	Monitoring Bore	Hydrasleeve	16.99	8.65		0	23	-%	0.91	9241	6.27	38	Brown	
MW68	30-Mar-22	Monitoring Bore	Pump	16.98	9.13		100	23.9	-%	0.05	8394	6.59	16.3	Clear	
MW68	08-Jul-22	Monitoring Bore	Submersible	17.15	9.04		120	23.7	-%	0	9758	6.42	141.8	Clear	
MW68	02-Nov-22	Monitoring Bore	Submersible	16.36	9.11	-	100	23.8	0.10%	0.01	8836	6.65	93.8		
MW68	03-Mar-23	Monitoring Bore	Submersible	17.19	9.42		80	23.8	0	0	8521	6.77	36		
MW68	07-Jun-23	Monitoring Bore	Submersible	17.29	9.9		80	23.6	4	0.33	8284	6.72	48.3		
MW68	07-Sep-23	Monitoring Bore	Submersible		10.69		70	23.6	2.2	0.18	8469	6.79	-26.6		
MW68	11-Dec-23	Monitoring Bore	Submersible		10.21		80	23.6	0.9	0.06	8447	6.59	-54.1		YSI Issues with pH/Redox
MW69	05-Mar-21	Monitoring Bore	Hydrasleeve	12.18	16.55		0	25.6	12.90%	-	776	6.87	102	Cloudy Brown	
MW69	07-Apr-21	Monitoring Bore	Hydrasleeve	16.61	11.62		0	24.5	14.20%	0.94	736	6.86	17.3		
MW69	21-Jan-22	Monitoring Bore	Hydrasleeve	16.32	11.1	0		23.4	-%	0.75	1179	6.14	156	Cloudy brown	
MW69	05-Apr-22	Monitoring Bore	Pump	16.65	11.32		50	25.3	-%	0.51	1157	6.56	38	Brown, turbid	

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Report Date Mar-24

Epic Environmental Pty Ltd
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Sample ID	Sample Date	Field Description	Sample Method / Location	Total Depth	Standing Water Level (mBTOC)	Purge Time (min)	Purge Volume (L)	Temp (oC)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Redox Potential (mV)	Sample Observations	Other Notes
MW69	14-Jul-22	Monitoring Bore	Submersible	16.55	11.48		0	0	-%	0	0	0	0	Brown, heavy sediment on pump	No sample collected, pump clogged at 16m and 13m. Sediment evident to 9m (above water level depth)
MW69	27-Oct-22	Monitoring Bore	Submersible	16.28	12.08	-	50	25.6	0.60%	0.04	1011	6.41	37.5		
MW69	07-Mar-23	Monitoring Bore	Submersible	15.57	12.2		50	25.3	6.1	0.49	1030	6.73	51.4		
MW69	13-Jun-23	Monitoring Bore	Submersible	17.5	12.3		70	24.3	0	0	1063	6.66	20.8		
MW69	12-Dec-23	Monitoring Bore	Submersible		13.35		50	24.4	0.1	0.01	1201	6.67	-52.8		YSI Issues with pH/Redox
MW70	05-Mar-21	Monitoring Bore	Hydrasleeve	16.93	9.03		0	24.6	9.10%	-	1036	7.09	64.9	Cloudy Grey, Strong sulfur odour	
MW70	07-Apr-21	Monitoring Bore	Hydrasleeve	16.85	8.46		0	25.2	13.00%	1.04	819	7.06	-66.7	Dark cloudy brown, strong H2S odour	
MW70	21-Jan-22	Monitoring Bore	Hydrasleeve	14.67	6.02	0		23.8	-%	0.97	667	6.69	-47	Cloudy brown	
MW70	05-Apr-22	Monitoring Bore	Submersible	16.69	7.25		120	25.4	-%	0.06	640	6.57	-8.1	Clear	
MW70	14-Jul-22	Monitoring Bore	Submersible	16.60	7.89		240	21.9	-%	0.22	714	6.63	104.4	Clear	
MW70	27-Oct-22	Monitoring Bore	Submersible	16.4	9.57	-	100	24.6	0%	0	855	6.39	3.1		
MW70	07-Mar-23	Monitoring Bore	Submersible	16.49	9.5		100	24.1	0	0	192	6.66	39.4		
MW70	13-Jun-23	Monitoring Bore	Submersible	18.5	7		12	23.8	0	0	726	6.62	23.8		
MW70	12-Dec-23	Monitoring Bore	Submersible		11.18		80	24	1	0.08	910	6.69	-43.1		YSI Issues with pH/Redox
MW71	05-Mar-21	Monitoring Bore	Hydrasleeve	18.83	10.63		0	26.1	23.30%	-	778	6.87	102.6	Clear	
MW72	19-Jan-21	Monitoring Bore	Hydrasleeve	17.67	12.98		0	25.1	37.70%	-	585	7.63	54.7		
MW72	20-Feb-21	Monitoring Bore	Hydrasleeve	17.57	12.34		0	22	16.20%	-	610	7.99	93.6	Clear	SWL @ 2.34/17.57
MW72	15-Dec-21	Monitoring Bore	Hydrasleeve	17.48	10.9		0	27.6	41.40%	3.25	987	6.86	76.8	Clear	Installed SN587908 Troll
MW72	19-Jan-22	Monitoring Bore	Hydrasleeve	17.47	10.16		0	25.5	-%	1.6	575	6.41	8.2	Clear	
MW72	30-Mar-22	Monitoring Bore	Submersible	17.42	10.59		90	26.1	-%	0.02	508	6.74	26.1	Clear	
MW72	08-Jul-22	Monitoring Bore	Submersible	17.65	11.2		90	22.5	-%	0	717	6.43	131.9	Clear	
MW72	29-Oct-22	Monitoring Bore	Submersible	17.41	11.77	-	60	20.8	8.30%	0.75	724	6.52	89.4		
MW72	02-Mar-23	Monitoring Bore	Submersible	17.52	12.95		70	23.9	0	0	846	6.79	90.1		
MW72	07-Jun-23	Monitoring Bore	Submersible	17.5	14		60	24.2	4.8	0.42	846	6.39	34.8		
MW72	05-Sep-23	Monitoring Bore	Submersible		13.73		60	21.8	5.2	0.46	732	6.69	-4.8		
MW72	11-Dec-23	Monitoring Bore	Submersible		14.8		35	23.1	1.6	0.14	753	6.88	-59.3		
MW73	19-Jan-21	Monitoring Bore	Hydrasleeve	17.92	10.69		0	27.7	23.60%	-	796	7.22	-32.4		
MW73	20-Feb-21	Monitoring Bore	Hydrasleeve	17.92	11.12		0	24.3	19.30%	-	71.9	7.4	124.1	Clear	SWL @ 11.12/17.92
MW73	15-Dec-21	Monitoring Bore	Hydrasleeve	17.86	11.18		0	26.1	-%	1.36	2286	6.27	-568	Cloudy and silty	Installed SN657759 troll
MW73	19-Jan-22	Monitoring Bore	Hydrasleeve	17.77	10.14		0	25.5	-%	1.28	41.5	6.31	41.9	Clear	
MW73	30-Mar-22	Monitoring Bore	Submersible	17.60	10.44		140	24.5	-%	0.09	878	6.43	48.2	Clear	
MW73	08-Jul-22	Monitoring Bore	Submersible	17.82	11.31		80	25	-%	0	857	6.26	102.3	Clear	
MW73	29-Oct-22	Monitoring Bore	Submersible	17.56	11.8	-	60	25.4	0.20%	0.02	1592	6.23	49.7		
MW73	02-Mar-23	Monitoring Bore	Submersible	17.8	12.06		120	24.4	0	0	2136	6.37	28.2		
MW73	07-Jun-23	Monitoring Bore	Submersible	17.54	12.46		60	25.9	5.3	0.42	2310	6.13	15.5		
MW73	05-Sep-23	Monitoring Bore	Submersible		12.69		70	24.1	0.9	0.07	2341	6.3	-148.8		
MW73	09-Dec-23	Monitoring Bore	Submersible		13.02		50	24.6	0.8	0.06	2443	6.37	-19.3		
MW74	16-Dec-21	Monitoring Bore	Hydrasleeve	27.49	12.56		0	25	-%	0.98	4196	7.04	-95.4	Cloudy	CS Collected
MW74	22-Jan-22	Monitoring Bore	Hydrasleeve	27.48	11.21		0	23.6	-%	0.69	7064	6.91	-144.8	Cloudy, strong sulfuric odour	
MW74	31-Mar-22	Monitoring Bore	Hydrasleeve	27.53	11.48		0	26.3	-%	1.41	2497	7.19	19.6	Clear	
MW74	14-Jul-22	Monitoring Bore	Hydrasleeve	28.81	11.68		0	17.3	-%	0.93	9391	6.9	182.1	Clear	Odour: H2S
MW74	02-Nov-22	Monitoring Bore	Hydrasleeve	27.83	10.9	-	0	23.8	8.30%	0.69	2566	7.04	-50.9		
MW74	02-Mar-23	Monitoring Bore	Hydrasleeve	28.02	10.37		0	28.3	19.6	1.56	3805	7.1	-13.5		
MW74	12-Jun-23	Monitoring Bore	Hydrasleeve	27.75	10.91			20.7	13.6	1.21	3282	6.99	-54.1		
MW74	06-Sep-23	Monitoring Bore	Hydrasleeve		11.38			22.1	12.4	1.09	3353	7.09	-49.1		
MW74	07-Dec-23	Monitoring Bore	Hydrasleeve		12.47		0	24.2	18.3	1.53	4039	7.49	-58.3		Hydrasleeve
MW75	02-Mar-21	Monitoring Bore	Hydrasleeve	21.67	4.62		0	24.9	8.80%	-	36875	6.62	134.8	Clear	2/3 1240
MW75	24-Jan-22	Monitoring Bore	Hydrasleeve	21.80	4.43		0	23	-%	0.89	37578	6.22	166.2	Cloudy	
MW75	06-Apr-22	Monitoring Bore	Sleeve	21.62	4.85		0	25.2	-%	1.15	31697	6.7	51.7	Clear	

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Sample ID	Sample Date	Field Description	Sample Method / Location	Total Depth	Standing Water Level (mBTOC)	Purge Time (min)	Purge Volume (L)	Temp (oC)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Redox Potential (mV)	Sample Observations	Other Notes
MW75	13-Jul-22	Monitoring Bore	Hydrasleeve	21.97	5.08		0	24.1	-%	0.52	38091	6.45	159.2	Slight Ash/Clear	
MW75	01-Nov-22	Monitoring Bore	Hydrasleeve	22.44	4.99	-	0	24.7	11.60%	0.88	19571	6.55	97.4		
MW75	03-Mar-23	Monitoring Bore	Hydrasleeve	22.4	4.48		0	24.5	21.2	1.62	29301	6.74	53.3		
MW75	13-Jun-23	Monitoring Bore	Hydrasleeve	20.5	4.83			25.8	17.8	1.41	18595	6.72	48.5		
MW76	22-Jan-22	Monitoring Bore	Hydrasleeve	26.22	19.01		0	25.6	-%	1.74	7421	7.29	-73.9	Brown, slight sulfuric odour	
MW76	07-Apr-22	Monitoring Bore	Hydrasleeve	25.97	19.02		0	27.8	-%	1.16	9393	7.13	80.1	Turbid/grey	
MW76	13-Jul-22	Monitoring Bore	Hydrasleeve	25.92	19.22		0	21	-%	1.16	9092	7.69	102.8	Ash Sediment	Pump lowered to 24m, clogged due to sediment. No sample collected on 13/07/2022. Hydrasleeve dropped 14/07/2022 13:45 at 24m, collected 7:30 15/07/2022
MW76	02-Nov-22	Monitoring Bore	Hydrasleeve	-	19.42	-	0	26.9	5.70%	0.44	8826	7.64	-15.2		Sediment in bottom of hydrasleeve
MW76	03-Mar-23	Monitoring Bore	Hydrasleeve	25.65	19.14		0	25.3	15.6	1.29	8532	7.83	32		
MW76	13-Jun-23	Monitoring Bore	Hydrasleeve	26.5	19.32			24.9	21.4	1.73	8434	8.01	14.5		
MW77	21-Jan-22	Monitoring Bore	Hydrasleeve	12.04	6.47	0		23.2	-%	1.26	12617	6.17	94.2	Cloudy brown	
MW77	06-Apr-22	Monitoring Bore	Pump	12.00	7.06		180	24	-%	0.05	13425	6.65	50.2	Clear	
MW77	10-Jul-22	Monitoring Bore	Submersible	12.00	6.86		60	23.6	-%	0	13999	6.46	84.6	Clear	
MW77	02-Nov-22	Monitoring Bore	Submersible	12.05	6.8	-	70	23.6	1.10%	0.9	13153	6.64	65.2		
MW77	01-Mar-23	Monitoring Bore	Submersible	11.99	6.82		50	23.9	1.7	0.15	12788	6.74	-5.2		
MW78	02-Apr-22	Monitoring Bore	Submersible	24.01	9.17		260	25.1	-%	0.01	11625	6.94	-56.6	Clear	
MW78	10-Jul-22	Monitoring Bore	Submersible	24.50	9.62		290	24.3	-%	0	11613	6.8	15.5	Clear	
MW78	03-Nov-22	Monitoring Bore	Submersible	24.5	9.49	-	300	25.1	0.00%	0	10899	6.91	76.2		
MW78	03-Mar-23	Monitoring Bore	Submersible	27	9.05		360	24.5	0	0	10352	7.07	35.9		
MW78	08-Jun-23	Monitoring Bore	Submersible	27	9.25			24.3	0	0	10394	7.08	23.2		
MW78	05-Sep-23	Monitoring Bore	Submersible		9.62		260	24.4	0.1	0.01	10460	7.08	15.4		
MW78	06-Dec-23	Monitoring Bore	Submersible		10.65		260	24.7	0.3	0.03	10622	7.29	-22.2		
MW79	20-Jan-21	Monitoring Bore	Hydrasleeve	18.56	1.56		0	23.7	14.70%	-	7391	6.92	155.2		Pooled water around gatic
MW79	14-Dec-21	Monitoring Bore	Hydrasleeve	18.65	0.88		0	24.7	-%	1.19	7926	6.32	76.4	Cloudy	
MW79	19-Jan-22	Monitoring Bore	Hydrasleeve	18.87	0.97		0	23	-%	2.41	8433	6.64	13	Cloudy Black, Strong sulfuric odour	
MW79	31-Mar-22	Monitoring Bore	Hydrasleeve	18.79	1.42		0	22.6	-%	0	7070	6.3	97.3	Clear	
MW79	12-Jul-22	Monitoring Bore	Hydrasleeve	18.77	1.46		0	22.2	-%	0.86	9120	6.3	13.4	Fine Sed	
MW79	27-Oct-22	Monitoring Bore	Hydrasleeve			-	0	29.3	11.40%	0.86	6352	6.38	-12.3		
MW79	02-Mar-23	Monitoring Bore	Hydrasleeve		1.9		0	25.3	5.5	0.44	8151	6.63	36.3		
MW79	13-Jun-23	Monitoring Bore	Hydrasleeve	19	0.89			21.7	13	1.12	7091	6.61	21.7		
MW80	19-Jan-21	Monitoring Bore	Hydrasleeve	7.29	1.2		0	26.4	59.00%	-	1780	8.63	77.4		
MW80	14-Dec-21	Monitoring Bore	Hydrasleeve	7.35	0.51		0	27.5	-%	5.31	1145	6.53	67.3	Cloudy	
MW80	19-Jan-22	Monitoring Bore	Hydrasleeve	7.32	0.43		0	25.6	-%	1.14	1182	10.54	-4.9	Clear	pH likely out of range of reality
MW80	30-Mar-22	Monitoring Bore	Hydrasleeve	7.25	1.09		0	22.8	-%	1.52	1663	8.05	-59.4	Cloudy	
MW80	12-Jul-22	Monitoring Bore	Hydrasleeve	7.32	1.14		0	19.6	-%	1.61	2633	7.22	36.9	Brown Sediment	
MW80	27-Oct-22	Monitoring Bore	Hydrasleeve			-	0	30.3	17.90%	1.3	900	-	-35.9		pH was not recorded on field sheet
MW80	02-Mar-23	Monitoring Bore	Hydrasleeve		1.65		0	28.9	3.3	0.26	970	10.18	36.1		
MW80	13-Jun-23	Monitoring Bore	Hydrasleeve	7.5	0.54			18.5	20.3	1.97	751	8.76	10.3		
MW80	05-Sep-23	Monitoring Bore	Hydrasleeve		1.67			23.9	14.7	1.22	4039	7.05	-107.9		
MW80	11-Dec-23	Monitoring Bore	Hydrasleeve		1.87		0	25	11.5	0.94	3974	7.19	-123		
MW81	08-Sep-23	Monitoring Bore	Submersible	22	9.2		140	24.7	0.7	0.05	6776	6.89	-24.5		
MW81	05-Dec-23	Monitoring Bore	Submersible		12.7		140	24.7	0.06	0.07	6590	7	-15.3		
MW82	09-Sep-23	Monitoring Bore	Submersible	24.5	8.12		140	24.2	0.4	0.03	9827	7.21	-12.8		
MW82	06-Dec-23	Monitoring Bore	Submersible		8.2		160	24.2	0.6	0.05	9724	7.26	-156.8		
MW83	09-Sep-23	Monitoring Bore	Submersible	22.7	5.99		15	22.9	0.8	0.06	7818	6.97	59.3		Attempted high flow, swap to low-flow
MW83	06-Dec-23	Monitoring Bore	Submersible		6.13		34	23.4	1	0.08	7905	7.02	-77.4		
MW84	08-Sep-23	Monitoring Bore	Submersible	1.5	6.46		120	24.9	0.7	0.06	5545	6.77	14.2		
MW84	06-Dec-23	Monitoring Bore	Submersible		6.5		120	24.7	0.2	0.02	5814	6.72	-85.7		
MW85	08-Sep-23	Monitoring Bore	Submersible	13.5	6.21		25	26.4	3.7	0.28	11146	12.23	-172.5		Attempted high flow, swap to low flow
MW85	06-Dec-23	Monitoring Bore	Submersible		6.32		17	25.3	14.7	1.18	9475	6.83	-106.2		
MW86	07-Sep-23	Monitoring Bore		15.6											DRY

Epic File: BC200153.03
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Report Date Mar-24

Epic Environmental Pty Ltd
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Table T1: Groundwater and Surface Water Field Parameters

Sample ID	Sample Date	Field Description	Sample Method / Location	Total Depth	Standing Water Level (mBTOC)	Purge Time (min)	Purge Volume (L)	Temp (oC)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Redox Potential (mV)	Sample Observations	Other Notes
MW89	07-Sep-23	Monitoring Bore	Submersible	12	8.03		6	24.4	1.4	0.12	7556	6.81	5		
MW89	08-Dec-23	Monitoring Bore	Submersible		10.56		10	26.9	20.2	1.61	7063	7.03	-16.6		Purged dry 7/12, sampled 8/12
MW90	07-Sep-23	Monitoring Bore	Submersible	31	7.2		100	24.2	0.5	0.04	8089	6.83	23.1		
MW90	07-Dec-23	Monitoring Bore	Submersible		9.5		160	24.5	0.4	0.04	8147	6.89	-42.3		
MW91	08-Sep-23	Monitoring Bore	Submersible	19.17	10.42		120	24.8	17.8	1.48	3981	6.87	-30.9		
MW91	08-Dec-23	Monitoring Bore	Submersible		12.22		80	25	4.3	0.37	3015	6.9	-37.9		
MW94	08-Sep-23	Monitoring Bore	Submersible	26	9.95		160	24.6	0.6	0.04	10574	7.08	-30.8		
MW94	06-Dec-23	Monitoring Bore	Submersible		11		160	24.7	0	0	10642	7.43	-30.7		
MW96	14-Jun-23	Monitoring Bore													Dry
MW96	09-Dec-23	Monitoring Bore													Dry
MW97	14-Jun-23	Monitoring Bore	Submersible	4	2.72		4	19.6	43	3.93	619	7.73	17.8		
MW97	08-Sep-23	Monitoring Bore	Submersible		3.51		1	20	36.8	3.36	686	7.75	36		Purged dry and sampled next day
MW97	09-Dec-23	Monitoring Bore													Dry
MW98	08-Sep-23	Monitoring Bore	Submersible	18.77	9.67		6	26.8	25.8	2.02	7841	7.53	11.5		
MW98	07-Dec-23	Monitoring Bore	Submersible		11		7	26.4	21.2	1.67	7505	7.61	-40.2		
NOTCH-V1	04-Mar-21	Weir	Weir	-	-	-	0	24.3	31.30%	-	19921	7.18	119	Clear, Algae Bloom	Taken from flow
NOTCH-V1	19-Jan-22	Weir	Weir	-	-	-	0	24.4	12.10%	0.73	21090	7.09		Algae, clear flow	CS Collected, ORP not available
NOTCH-V1	31-Mar-22	Weir	Weir	-	-	-	0	19.5	-%	3.64	15713	6.94	61.6	Clear	
Notch-V1	26-Oct-22	Weir	Weir					32.3	99.80%	6.63	17568	7.48	52.7		
Notch-V1	27-Feb-23	Weir	Weir					27.7	57.2	4.24	17680	7.26	89.8		
Notch-V1	08-Jun-23	Weir	Weir					14.6	62.3	5.95	13773	7.46	79.3		
Notch-V1	05-Dec-23							29.3	66.8	4.76	18444	7.66	-16.2		
NOTCH-V2	04-Mar-21	Weir	Weir	-	-	-	0	25	94.10%	-	9729	7.93	99.9	Clear	Taken from flow
NOTCH-V2	19-Jan-22	Western Seepage Trench	Western Seepage Notch Weir	-	-	-	0	29.6	4.20%	0.33	17930	7.14		Clear, algae	ORP not working and DO% out of calibration
NOTCH-V2	31-Mar-22	Western Seepage Trench	Western Seepage Notch	-	-	-	0	28.7	-%	6.19	17446	7.7	69.5	Clear, slightly salty odour	
Notch-V2	26-Oct-22	Western Seepage Trench	Western Seepage Notch Weir					30.6	100.00%	7.26	15983	7.74	41.6		
Notch-V2	27-Feb-23							29.7	100	8.79	16385	7.84	100.8		
Notch-V2	08-Jun-23							14.8	91.4	8.7	13673	7.98	73.1		
Notch-V2	05-Dec-23							30.9	94.5	6.64	19150	7.83	-82.2		
NSP	19-Jan-22	Callide A NSP	DRY	-	-	-	0	0	-%	0	0	0	0		
PW1	04-Mar-21	Ash Dam B	Ash Dam B	-	-	-	0	27.5	64.50%	-	6628	8.41	94.6	Cloudy Grey, Slight sulfur smell	
PW1	19-Jan-22	Ash Dam B	Ash Dam B	-	-	-	0	29.2	211.20%	18.5	9796	8.3		Cloudy, slight saline odour	ORP not working and DO% out of calibration
PW1	13-Jul-22	Ash Dam B	Ash Dam B	-	-	-	0	17.9	-%	8.81	9015	7.94	122.9	Clear	Weather: cool, sunny. Stream flow: low (~35m). Pollution: scum on surface near sample location.
PW1	26-Oct-22							28.8	68.00%	5.1	9327	8.06	30.1		
PW1	28-Feb-23							27.6	57	4.34	9759	8.16	80.1		
PW1	12-Jun-23							19.1	82.1	7.42	6631	8.11	41.8		
PW1		Ash Dam B	Ash Dam B	-	-	-	0	27.1	-%	6.72	10341	8.21	28.3	Green/brown	
PW2	04-Mar-21	Ash Dam B	Ash Dam B	-	-	-	0	27.8	89.50%	-	10676	8.37	88.2	Cloudy, Slight saline and sulfur smell	Taken with Pole
PW2	19-Jan-22	Ash Dam B	Sampled from southern portion	-	-	-	0	29.3	197.10%	14.66	9963	8.31		Ash on surface	CS Collected
PW2	12-Jul-22	Ash Dam B	Ash Dam B	-	-	-	0	17.6	-%	7.76	9782	8.06	176.2	Grey, slight turbidity	Weather: cool, overcast (90% cloud). Stream flow: still water body. Pollution: ash on surface.
PW2	26-Oct-22							27.7	81.30%	5.98	10509	8.04	28.7		
PW2	27-Feb-23	Ash Dam B	Ash Dam B					28.7	81.5	6.11	9719	8.21	85.1		
PW2	06-Jun-23	Ash Dam B	Ash Dam B					21.4	100	8.88	9296	8.27	59.4		
PW2	04-Sep-23							24.2	73.7	5.98	10038	8.45	45.2		
PW2	05-Dec-23							31.4	66.1	4.65	10578	8.18	-15.1		
PW2		Ash Dam B	Ash Dam B	-	-	-	0	27.1	-%	5.6	9988	8.15	37.5	Green/brown	
R2	01-Nov-22							26.1		10.21	970	8.6	77.9		

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Table T1: Groundwater and Surface Water Field Parameters

Sample ID	Sample Date	Field Description	Sample Method / Location	Total Depth	Standing Water Level (mBTOC)	Purge Time (min)	Purge Volume (L)	Temp (oC)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Redox Potential (mV)	Sample Observations	Other Notes
RN13030112	19-Jan-22	State Bore	Hydrasleeve	15.45	8.85		0	24.3	-%	1.1	1209	5.71	-106.6	Clear	
RN13030112	29-Mar-22	Monitoring Bore	Hydrasleeve	15.50	8.76		0	22.1	-%	1.02	1710	6.59	-76.9	Cloudy	
RN13030112	12-Jul-22		Hydrasleeve	17.40	8.55		0	23.3	-%	0.38	1806	6.57	208.8	Slightly Brown	Hydrasleeve contained large holes on retrieval. Not enough water to sample. Dropped a second sleeve down at 2:30pm 13/07/2022 and collected at 3pm 13/07/2022. Water sample collected from second sleeve (also contained holes). Kink in bore around 15.7m. Not
RN13030112	31-Oct-22	Monitoring Bore	Hydrasleeve		8.25		0								Well casing bent, could not get hydrasleeve into screen
RN13030112	04-Mar-23	Monitoring Bore	Hydrasleeve	14.5	8.35	0	0	0	0	0	0	0	0		Couldn't get hydrasleeve down well
RN13030112	12-Jun-23	Monitoring Bore	Hydrasleeve		8.72										Kink in well casing, couldn't sample
RN13030126	19-Jan-22	State Bore	Hydrasleeve	19.39	10.28		0	25.3	-%	1.42	218	5.93	-161	Cloudy brown, slight sulfuric odour	
RN13030126	29-Mar-22	Monitoring Bore	Pump	19.03	10.03		120	24.8	-%	0.02	486.6	6.5	-26.1	Clear	
RN13030126	14-Jul-22		Submersible	19.34	10.16		160	24.1	-%	0	570	6.53	60.8	Clear	Stablised - sampled collected at 160L. No tubing left in well.
RN13030126	29-Oct-22	Monitoring Bore	Submersible	19.2	10.2	-	100	24.7	0.00%	0	519	6.44	54		
RN13030126	06-Mar-23	Monitoring Bore	Submersible	19.36	10.49		100	24.8	0	0	521	6.69	72.5		
RN13030126	10-Jun-23	Monitoring Bore	Submersible	19.6	10.63		90	24.5	0	0					
RN13030126	07-Sep-23		Submersible	19.37	10.9		100	24.6	0.8	0.06	589	6.63	-18.2		
RN13030126	09-Dec-23		Submersible		11.35		100	24.6	0.2	0.02	614	6.8	-28.1		
RN13030127	07-Apr-22	Monitoring Bore		15.50	15.8		20	32.7	-%	0.57	1299	6.11	-91.6	Brown, organic odour	
RN13030127	03-Nov-22	Monitoring Bore	Hydrasleeve	15.48	10.26	-	0	23.9	30.30%	2.57	814	7.08	5.9		Couldn't stabilise, pump was not strong enough to pump well dry, deployed hydrasleeve on 2nd Nov and picked up on 3rd Nov
RN13030127	07-Mar-23	Monitoring Bore	Submersible	15.37	10.38		5	27.3	6.8	0.53	727	6.94	-67.6		Purged dry on 6/3/23, sampled 7/3/23
RN13030127	10-Jun-23	Monitoring Bore	Submersible	17.4	10.5			28.7	0.25	3.6	907	6.76	-136.1		
RN13030127	06-Sep-23		Submersible	15.6	10.72		10	30	7.6	0.6	892	7	-150.4		Purged dry and sampled next day
RN13030127	09-Dec-23		Submersible		12.64		5								Purged dry 9/12, not enough recharge to sample during program (water level 14.7 when checked on 12/12/2023
RN13030692	18-Jan-22	State Bore	Hydrasleeve	17.21	9.29		0	25.4	42.00%	3.43	521	6.89		Clear	ORP not working and DO% out of calibration
RN13030692	29-Mar-22	Monitoring Bore	Submersible	17.27	8.81		100	24.8	-%	0.07	431.1	6.5	16.4	Clear	
RN13030692	07-Jul-22		Submersible	17.48	9.29		160	24.4	-%	0.62	478.1	6.37	141.9	Clear	
RN13030692	26-Oct-22	Monitoring Bore	Submersible	17.02	9.68	-	85	25.6	15.50%	1.24	471	6.34	32.1		
RN13030692	01-Mar-23	Monitoring Bore	Submersible	17.31	9.96		80	24.8	20.8	1.73	479	6.72	88.5		
RN13030692	09-Jun-23	Monitoring Bore	Submersible	17.21	10.3		80	24.4	22.7	1.92	488	6.62	68.1		
RN13030692	05-Sep-23		Submersible	17.5	10.63		80	24.9	21.1	1.74	515	6.61	90.8		
RN13030692	08-Dec-23		Submersible		11		70	24.7	29.6	2.46	515	6.92	31.3		
RN13030697	19-Jan-22	State Bore	Hydrasleeve	12.08	9.46		0	24.7	-%	5.02	1417	6.75	20.7	Clear	
RN13030697	30-Mar-22	Monitoring Bore	Submersible	11.72	9.72		2	28.2	-%	0.29	1388	7.08	-129.2	Black, cloudy	
RN13030697	14-Jul-22			11.70	9.8		0	0	-%	0	0	0	0		No sample collected - pumped at 11m of 10.5m at 12 volts with no water out of well.
RN13030697	03-Nov-22	Monitoring Bore	Hydrasleeve	12.17	9.49	-	0	24.3	16.50%	1.36	1214	6.93	-79		Purged dry, not enough recharge to sample when returning to well so hydrasleeved it instead
RN13030697	06-Mar-23	Monitoring Bore	Submersible	12.26	9.12		5	27.3	0	0	1152	7.07	-75.5		Purged dry 4/3/23, sampled 6/3/23
RN13030697	10-Jun-23	Monitoring Bore	Submersible	12.26	9.25			27.4	37.8	3.05	1295	6.87	-47.1		
RN13030697	06-Sep-23		Submersible	12.3	9.38		5	28.3	5.6	0.43	1410	7.02	-134.2		Purged dry and sampled next day
RN13030697	09-Dec-23		Hydrasleeve		10.7		5	30.8		0.62	1251	7.08	-89.7		Purged dry 8/12, sampled 9/12
RN13030698	18-Jan-22	State Bore	Hydrasleeve	19.17	8.52		0	26.6	59.00%	4.67	2331	6.7		Clear, strong sulfuric odour	ORP not working and DO% out of calibration
RN13030698	29-Mar-22	Monitoring Bore	Submersible	18.80	8.6		130	24.1	-%	1.05	1576	6.53	16.2	Clear	
RN13030698	07-Jul-22		Submersible	19.21	8.23		120	23.7	-%	0.75	2149	6.4	174.1	Clear	
RN13030698	29-Oct-22	Monitoring Bore	Submersible	19	7.96	-	120	23.8	7.40%	0.64	1940	6.67	125.2		
RN13030698	01-Mar-23	Monitoring Bore	Submersible	8.1	19.14		120	24	6.8	0.57	2142	6.64	56.4		
RN13030698	09-Jun-23	Monitoring Bore	Submersible	19.11	8.68		100	23.6	14	1.19	2313	6.61	68.9		
RN13030698	05-Sep-23		Submersible	19	8.78		100	24	11.7	1	2646	6.59	83.1		
RN13030698	09-Dec-23		Submersible		9.18		120	23.9	14.6	1.2	2644	6.75	-5.4		

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RN13030715	29-Mar-22	Monitoring Bore	Submersible	14.42	9.96		50	24.6	-%	5.93	2485	6.87	52.7	Clear	
RN13030715	07-Mar-23	Monitoring Bore	Submersible	14.63	9.4		60	24.5	60.3	5.13	224	7.1	62.8		
RN13030715	10-Jun-23	Monitoring Bore	Submersible	18	9.55		90	23.9	84.8	7.13	2628	7.15	57.6		
RN13030715	05-Sep-23		Submersible	14.6	9.8		60	24.1	73	6.1	2821	7.08	81.3		
RN13030715	09-Dec-23		Submersible		10.14		60	23.9	68.2	5.71	2897	7.03	21.4		
SW02	14-Dec-21	Causeway	Causeway	0.65	-	-	0	25.1	-%	5.87	4558	7.32	67.3	Cloudy	
SW02	16-Dec-21	Surface Water		-	-	-	0	23.5	-%	4.87	399.8	7.42	36.3	Clear	CS Collected
SW02	18-Jan-22	Causeway	Samples upstream of causeway	0.70	-	-	0	26.2	80.90%	6.53	482.5	7.34		Clear	ORP not working and DO% out of calibration
SW02	31-Mar-22	Surface Water	Causeway	-	-	-	0	23.5	-%	0.7	713	7.2	14.4	Clear, algae growth	Minimal flow
SW02	26-Oct-22	Causeway	Causeway					23.3	45.20%	3.86	529	7.51	102.3		
SW02	28-Feb-23	Causeway	Causeway					31.5	50.6	3.67	2631	8.25	47.1		
SW02	12-Jun-23	Causeway	Causeway					21.6	66.3	5.93	514	7.43	58.4		
SW08	04-Mar-21	Turkey Nest	Turkey Nest	-	-	-	0	28.4	54.80%	-	450.3	8.26	96.4	Slight green tint	Taken with Pole
SW12	18-Jan-22	Base of Spill Way	Callide Creek at base of Callide Dam	-	-	-	0	27.3	100.00%	8.01	435	7.41		Cloudy	ORP not working and DO% out of calibration
SW12	31-Mar-22	Base of Spill Way	Callide Creek at Base of Callide Dam	-	-	-	0	27.8	-%	5.31	652	7.57	34.4	Clear, algae growth	
SW12	28-Feb-23	Base of Spill Way	Callide Creek at base of Callide Dam					36.5	78.4	5.1	4347	8.01	56.6		
SW12	07-Jun-23	Base of Spill Way	Callide Creek at base of Callide Dam					18.6	88.1	8.22	557	7.97	52.7		
SW12	04-Sep-23							27.8	102.4	7.95	3509	8.1	34.7		
SW12	05-Dec-23							33.4	97.4	6.82	4064	8.32	20.8		
SW13	19-Jan-22	Western Seepage Trench	Western Seepage Noth Weir	-	-	-	0	29.4	5.40%	0.37	20267	8.21		Clear, algae	ORP not working and DO% out of calibration
SW13	31-Mar-22	Westerm Seepage Trench	Western Seepage Noth Weir	-	-	-	0	0	-%	0	0	0	0		DRY
SW13	26-Oct-22							27.9	100.00%	8.36	12500	7.46	58.3		
SW13	27-Feb-23	Westerm Seepage Trench	Western Seepage Noth Weir					27.7	49.6	3.77	11512	6.94	78		
SW13	05-Dec-23							31.8	75.7	5.19	14520	8.09	4		
SW17	19-Jan-22	Dunn Creek	Dunn Creek	-	-	-	0	34.9	238.50%	16.41	4653	7.81		Cloudy	ORP not working and DO% out of calibration
SW20	18-Jan-22	Callide Dam	Collected immediately adjacent to the park	-	-	-	0	35.4	20.10%	13.89	426	8.84		Milky, fishy odour	ORP not working and DO% out of calibration
SW20	31-Mar-22	Callide Dam	Limited Disturbance, Easternside	-	-	-	0	27.1	-%	3.82	383.9	7.92	46.3	Cloudy	
SW20	26-Oct-22	Callide Dam	Collected immediately adjacent to the park					28.2	95.40%	7.43	371.3	8.27	83		
SW20	28-Feb-23	Callide Dam	Limited Disturbance, Easternside					31	72.8	5.34	454	8.87	57		
SW20	10-Jun-23	Callide Dam	Collected adjacent to the park					18.9	90.6	8.41	392	8.81	33.3		
SW20	11-Dec-23							27.8	52.4	4.11	515	8.41	-21.8		Issues with pH and Redox on YSI
SW22	18-Jan-22	Linkes Road Crossing	Callide Creek at Linkes crossing	-	-	-	0	28	41.80%	3.28	567	6.99		Clear	ORP not working and DO% out of calibration
SW22	31-Mar-22	Linkes Road Crossing	Callide Creek at Linkes crossing	-	-	-	0	22.7	-%	0.36	762	7.3	110.1	Clear, slight clear film	
SW22	26-Oct-22							24.1	52.10%	4.37	687	7.68	103.7		
SW22	07-Mar-23	Linkes Road Crossing	Callide Creek at Linkes crossing					30.4	35.7	2.68	215	7.74	43.4		
SW22	07-Jun-23	Linkes Road Crossing	Callide Creek at Linkes crossing					17.9	33.1	3.02	1008	7.49	61.3		
SW22	04-Sep-23							28.1	105.3	8.2	1609	8.27	36.2		
SW22	05-Dec-23							33.5	100	8.48	2537	8.81	9.1		
SW28	31-Mar-22			-	-	-	0	0	-%	0	0	0	0		Inaccessible from road, cannot sample
SW28	27-Feb-23		-	-	-	-	-	-	-	-	-	-	-	-	DRY

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Sample ID	Sample Date	Field Description	Sample Method / Location	Total Depth	Standing Water Level (mBTOC)	Purge Time (min)	Purge Volume (L)	Temp (oC)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Redox Potential (mV)	Sample Observations	Other Notes
SW29	21-Jan-22	Shorts Road	Collected from dam next to road	-		0		26.8	-%	7.17	453	7.87	15.3	Cloudy	Collected from the dam which is fed from the northern watercourse
SW32	20-Jan-22	Surface Water	Ponded water	-	-	-	0	28.2	107.40%	8.41	333	8			CS Collected - Fresh water snail bloom and mowed grass
SW32	22-Jan-22	Northern water channel	Dry	-	-	-	0	0	-%	0	0	0	0		
SW32	31-Mar-22	Northern water channel	Dry	-	-	-	0	0	-%	0	0	0	0		
SW32	26-Oct-22	Surface Water	Ponded water					22.1	65.60%	5.56	214.4	7.33	94.6		
SW32	27-Feb-23		-	-	-	-	-	-	-	-	-	-	-	-	DRY
SW34	16-Dec-21	Surface Water		-	-	-	0	22.3	-%	4.87	399.8	7.42	36.3	Clear	CS Collected
SW34	19-Jan-22	Pond of water	Northern site boundary	-	-	-	0	26.1	84.60%	6.86	743	7.28		Brown	ORP not working and DO% out of calibration
SW34	31-Mar-22	Pond of Water	Northern Site Boundary	-	-	-	0	0	-%	0	0	0	0		DRY
SW34	26-Oct-22	Pond of water	Northern site boundary					27.3	7.40%	0.58	460.9	6.85	-83.7		
SW34	27-Feb-23		-	-	-	-	-	-	-	-	-	-	-	-	DRY
SW35	31-Mar-22			-	-	-	0	0	-%	0	0	0	0		DRY
SW35	27-Feb-23		-	-	-	-	-	-	-	-	-	-	-	-	DRY
SW36	24-Jan-22	Pelican Point	Pelican Point	-	-	-	0	29.5	-%	9.78	446	8.49	33.7	Clear, Strong sewage smell	
SW36	31-Mar-22	Pelican Point	Pelican Point	-	-	-	0	28.4	-%	6.85	376.3	7.96	25.1	Cloudy	Dam north side, higher than previous sampling
SW36	26-Oct-22	Pelican Point	Pelican Point					30.5	100.00%	9.91	360.2	8.63	85.6		
SW36	28-Feb-23							29.3	67.7	5.2	377	8.65	58.9		
SW36	10-Jun-23							18.5	100	10.15	394	8.95	19.3		
SW37	31-Mar-22	Stagnant Pool of Water		-	-	-	0	22.5	-%	7.62	2286	7.95	32.5	Clear	
SW37	03-Nov-22	Stagnant Pool of Water						23.6		5.4	628	7.75	105.9		
SW37	27-Feb-23		-	-	-	-	-	-	-	-	-	-	-	-	Too shallow to sample
SW40	18-Jan-22	Jambin-Dakenba Rd	Sampled off old roadway	-	-	-	0	28.1	49.90%	4.3	985	7.15		Milky, slight swampy odour	ORP not working and DO% out of calibration
SW40	31-Mar-22	Jambin-Dakenba Rd	Sampled off old roadway	-	-	-	0	23.4	-%	2.63	621	7.07	4.7	Clear, swampy odour	Stagnant water, algae bloom
SW40	26-Oct-22							24	17.40%	1.46	720	6.78	119.2		
SW40	07-Jun-23							17.7	24.4	2.32	972	7.17	62.2		
SW41	24-Jan-22	Sunwater Weir	Sunwater Weir	-	-	-	0	26.6	-%	3.88	340.2	7.05	26.2	Algae	Completed with bottles under supervion of Sunwater
SW41	02-Nov-22	Sunwater Weir	Sunwater Weir					24		4.98	2411	7.54	118		Algae present on surface
SW41	06-Mar-23							34.2	29.7	2.09	672	7.6	63.1		
SW41	12-Jun-23							19.4	47.6	4.36	969	7.68	26.4		
SW41	08-Dec-23							34.9	67.5	4.61	3094	7.78	19.3		
SW41		Sunwater Weir	Sunwater Weir	-	-	-	0	27.7	-%	2.69	713	7.22	104.1	Green/brown, stagnant odour	
SW42	01-Nov-22							28.1		5.97	3040	7.84	120.2		
SW43	31-Mar-22		Very low <30cm, stagnant	-	-	-	0	30.9	-%	7.78	143.7	7.76	29.5	Clear, slight hydrogen sulfide smell	
SW43	28-Feb-23							26.9	58.1	4.63	423	7.5	67.3		
SW44	31-Mar-22			-	-	-	0	0	-%	0	0	0	0		Inaccessible due to vegetation
SW44	27-Feb-23		-	-	-	-	-	-	-	-	-	-	-	-	DRY
SW45	09-Sep-23							24.6	73	6.47	1271	9	20.5		
SW45	05-Dec-23							31.1	57.4	4.9	1368	9.08	-38.4		
SW46	31-Mar-22			-	-	-	0	0	-%	0	0	0	0		DRY
SW46	27-Feb-23		-	-	-	-	-	-	-	-	-	-	-	-	DRY

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T2: Groundwater and Surface Water Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Company	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (µg/L)	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)						Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)										Perfluoroalkyl Sulfonamides (µg/L)							Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)		
								PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)							-	-	-	-	-	**0.0002**	-	-	-	-	-	-	**19**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)							-	-	-	-	-	**0.1300**	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water							-	-	-	-	-	-	-	**0.0700**	-	-	-	-	**0.56**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water							-	-	-	-	-	-	-	**2.0000**	-	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L) - Standard Analysis							20-500	0.001	0.001	0.001	0.001	0.0001	0.001	0.0010	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005	-	-
Laboratory Level of Reporting (µg/L) - TOPA							-	0.002	0.002	0.002	0.002	0.002	0.002	0.0020	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.002
Groundwater																																						
03-Nov-20	EB2029263069	-	MW01	Onsite - North-western Boundary (Upgradient)	Groundwater	Standard	<20	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0080	**0.003**	**0.0051**	**0.0019**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0400**	<0.002	<0.002	**0.0500**	-	-
03-Nov-20	EB2029263069	-	MW01	Onsite - North-western Boundary (Upgradient)	Groundwater	TOPA	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	**0.012**	**0.0140**	**0.003**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.0290**	**0.0290**	**0.019**
07-Apr-22	EB2209861001	-	MW01	Onsite - North-western Boundary (Upgradient)	Groundwater	Standard	-	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0081	<0.0016	**0.0019**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0019**	-	-
04-Nov-20	EB2323870016	-	MW01	Onsite - North-western Boundary (Upgradient)	Groundwater	Standard	-	<0.0005	<0.0008	<0.0008	<0.0008	<0.0014	<0.0008	<0.0008	<0.0040	**0.0022**	**0.0031**	**0.0008**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0061**	-	-
02-Mar-23	EB2306934016	-	MW01	Onsite - North-western Boundary (Upgradient)	Groundwater	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	**0.0018**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0010**	<0.001	<0.001	**0.0028**	-	-
14-Jun-23	EB2318365918	-	MW05	Western Stormwater Diversion Channel	Groundwater	Standard	-	**0.0103**	**0.0037**	**0.0211**	<0.0005	**0.0092**	<0.0005	**0.0303**	<0.0079	<0.0016	<0.0005	<0.0005	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0443**	-	-
03-Nov-20	EB2029263031	-	MW09	Onsite - SSCA	Groundwater	Standard	<20	**0.0151**	**0.0073**	**0.0371**	**0.0016**	**0.0455**	<0.0008	**0.0826**	<0.0050	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0019	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.0070**	<0.001	<0.001	**0.1140**	-	-
03-Nov-20	EB2029263031	-	MW09	Onsite - SSCA	Groundwater	TOPA	-	**0.0220**	**0.008**	**0.052**	<0.002	**0.0730**	<0.002	**0.1250**	<0.01	**0.004**	**0.0120**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.1710**	**0.1710**	**0.107**
20-Jan-21	EB2101853012	-	MW09	Onsite - SSCA	Groundwater	Standard	<20	**0.0134**	**0.0074**	**0.0355**	**0.0014**	**0.0338**	<0.0005	**0.0693**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0915**	-	-
20-Jan-21	EB2102849012	-	MW09	Onsite - SSCA	Groundwater	TOPA	-	**0.0170**	**0.009**	**0.035**	<0.008	**0.0400**	<0.002	**0.0750**	<0.01	**0.003**	**0.0110**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.1150**	**0.1150**	**0.072**
20-Oct-21	EB2130810035	-	MW09	Onsite - SSCA	Groundwater	Standard	-	**0.0134**	<0.0079	**0.0387**	<0.0079	**0.0419**	<0.0079	**0.0806**	<0.0395	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0198	<0.0079	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	<0.008	<0.008	<0.008	<0.008	**0.0940**	-	-
20-Jan-22	EB2029169044	-	MW09	Onsite - SSCA	Groundwater	Standard	-	**0.0188**	**0.0088**	**0.0383**	<0.0016	**0.0460**	<0.0016	**0.0843**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.1120**	-	-
03-Apr-22	EB209243051	-	MW09	Onsite - SSCA	Groundwater	Standard	-	**0.0172**	**0.0079**	**0.0427**	**0.0013**	**0.0470**	<0.0008	**0.0897**	<0.0040	<0.0008	<0.0008	<0.0008	**0.008**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.1240**	-	-
09-Jul-22	EB2220051036	-	MW09	Onsite - SSCA	Groundwater	Standard	-	**0.0210**	<0.0072	**0.0356**	<0.0009	**0.0374**	<0.0005	**0.0730**	<0.0078	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0940**	-	-
03-Nov-20	EB2323870009	-	MW09	Onsite - SSCA	Groundwater	Standard	-	**0.0199**	<0.0055	**0.0268**	<0.0015	**0.0249**	<0.0008	**0.0513**	<0.0040	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.0020**	<0.001	<0.001	**0.0732**	-	-
03-Mar-23	EB2306934030	-	MW09	Onsite - SSCA	Groundwater	Standard	-	**0.0221**	**0.0062**	**0.0407**	<0.0020	**0.0531**	<0.0008	**0.0938**	<0.0395	<0.0079	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.1220**	-	-
14-Jun-23	EB2318365009	-	MW09	Onsite - SSCA	Groundwater	Standard	-	**0.0123**	**0.0073**	**0.0405**	**0.0011**	**0.0434**	<0.0005	**0.0839**	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.1030**	-	-
06-Sep-23	EB2328001007	-	MW09	Onsite - SSCA	Groundwater	Standard	-	**0.0163**	**0.007**	**0.0382**	**0.0011**	**0.0535**	<0.0005	**0.0917**	<0.0079	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.001	**0.0010**	<0.001	<0.001	**0.1170**	-	-
08-Dec-23	EB2339753017	-	MW09	Onsite - SSCA	Groundwater	Standard	-	**0.0166**	**0.007**	**0.0392**	<0.0015	**0.0476**	<0.0005	**0.0868**	<0.0082	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1100**	-	-
01-Apr-22	EB2092243038	-	MW11	Onsite - SSCA	Groundwater	Standard	-	**0.0152**	**0.008**	**0.0466**	<0.0016	**0.0253**	<0.0016	**0.0719**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0951**	-	-
09-Jul-22	EB2220051035	-	MW11	Onsite - SSCA	Groundwater	Standard	-	**0.0138**	<0.0074	**0.046**	<0.0017	**0.0315**	<0.0005	**0.0775**	<0.0076	<0.0015	<0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0015	<0.0015	<0.0038	<0.0015	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.002	<0.001	<0.001	<0.001	**0.0913**	-	-
28-Oct-22	EB2320600028	-	MW11	Onsite - Adjacent to ESCA	Groundwater	Standard	-	**0.0147**	**0.0067**	**0.0342**	**0.0009**	**0.0174**	<0.0005	**0.0516**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0245	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	**0.0030**	<0.001	<0.001	**0.0769**	-	-
02-Mar-23	EB2306934019	-	MW11	Onsite - Adjacent to ESCA	Groundwater	Standard	-	**0.0183**	**0.0076**	**0.0403**	<0.0016	**0.0260**	<0.0016	**0.0753**	<0.0399	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.1010**	-	-
08-Jun-23	EB2318365010	-	MW11	Onsite - Adjacent to ESCA	Groundwater	Standard	-	**0.0123**	**0.0068**	**0.0409**	**0.0009**	**0.0184**	<0.0005	**0.0593**	<0.0079	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.0793**	-	-
06-Mar-23	EB2306935015	-	MW23	Onsite - ESCA	Groundwater	Standard	-	**0.0330**	**0.0325**	**0.222**	**0.0072**	**0.0709**	<0.0005	**0.0930**	<0.0079	<0.0016	<0.0015	<0.0015	<0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.3660**	-	-
14-Jun-23	EB2318365011	-	MW25	Onsite - Western Boundary	Groundwater	Standard	-	**0.0034**	<0.0005	**0.0039**	<0.0005	**0.0089**	<0.0005	**0.0128**	<0.0080	**0.0093**	**0.0054**	**0.0094**	**0.0009**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0412**	-	-
21-Jan-21	EB2101853017	-	MW27	Onsite - Western Boundary	Groundwater	Standard	<20	**0.0062**	**0.0029**	**0.0091**	<0.0005	**0.0012**	<0.0005	**0.0103**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0194**	-	-
21-Jan-21	EB2101853017	-	MW27	Onsite - Western Boundary	Groundwater	TOPA	-	**0.0060**	<0.005	**0.009**	<0.002	<0.002	<0.002	**0.0090**	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.0150**	**0.0150**	**0.009**
14-Jun-23	EB2318365012	-	MW27	Onsite - Western Boundary	Groundwater	Standard	-	**0.0205**	**0.0076**	**0.0298**	<0.0005	**0.0022**	<0.0005	**0.0320**	<0.0080	<0.0005	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0030**	<0.001	<0.001	**0.0631**	-	-
01-Apr-22	EB2092243037	-	MW30	Onsite - Adjacent to ESCA	Groundwater	Standard	-	**0.0055**	**0.105**	**0.498**	**0.0232**	**0.0140**	<0.0005	**0.6140**	**0.0180**	**0.0068**	**0.0376**	**0.0042**	**0.014**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.9080**	-	-
29-Oct-22	EB2320600029	-	MW30	Onsite - Adjacent to ESCA	Groundwater	Standard	-	**0.0403**	**0.0368**	**0.236**	**0.009**	**0.0545**	<0.0005	**0.2900**	**0.0108**	**0.0012**	**0.0061**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0160**	<0.001	<0.001	**0.4130**	-	-
28-Feb-21	EB2105661034	-	MW31	Offsite - Adjacent to ESCA	Groundwater	Standard	-	<0.0032	<0.0032	<0.0032	<0.0032	**0.0035**	<0.0032	**0.0035**	<0.0032	<0.0032	**0.0041**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0079	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.0200**	<0.003	<0.003	**0.0276**	-	-
23-Oct-21	EB2130810018	-	MW31	Offsite - Adjacent to ESCA	Groundwater	Standard	-	<0.0077	<0.0077	<0.0077	<0.0077	<0.0077	<0.0077	<0.0077	<0.0386	**0.0093**	**0.0170**	<0.0077	<0.0077	<0.0077	<0.0077	<0.0077	<0.0077	<0.0077	<0.0193	<0.0077	<0.019	<0.019	<0.019	<0.019	<0.0077	<0.0077	<0.008	<0.008	<0.008	<0.008	**0.0723**	-	-
20-Jan-22	EB2029169039	-	MW31	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.0403**	<0.0008	**0.0368**	**0.0012**	**0.0422**	<0.0008	**0.0808**	<0.0040	**0.0012**	**0.0032**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.0160**	<0.001	<0.001	**0.1160**	-	-
01-Apr-22	EB2092243035	-	MW31	Offsite - Adjacent to ESCA	Groundwater	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0005	<0.0002	<0.0080	<0.0016	<0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.0016	-	-
08-Jul-22	EB2220051031	-	MW31	Offsite - Adjacent to ESCA	Groundwater	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0018	<0.0005	<0.0005	<0.0079	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0039	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0016	-	-
28-Oct-22	EB2232600027	-	MW31	Offsite - Adjacent to ESCA	Groundwater	Standard	-	<0.0016	<0.0016	<0.0005	<0.0005	**0.0003**	<0.0005	**0.0003**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	**0.0100**	<0.001	<0.001	**0.0103**	-	-
04-Mar-23	EB2306934033	-	MW31	Offsite - Adjacent to ESCA	Groundwater	Standard	-	<0.0005	<0.0005	<0.0010	<0.0005	**0.0007**	<0.0005	**0.0007**	<0.0079	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0007**	-	-
09-Jun-23	EB2318365013	-	MW31	Offsite - Adjacent to ESCA	Groundwater	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	**0.0007**	<0.0005	**0.0007**	<0.0079	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0007**	-	-
08-Dec-23	EB2339753018	-	MW31	Offsite - Adjacent to ESCA	Groundwater	Standard	-	<0.0016	<0.0005	<0.0010	<0.0005	<0.0006	<0.0005	<0.0005	<0.0080	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	-	-
28-Feb-21	EB2105661038	-	MW32	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.5790**	**0.694**	**4.64**	**0.193**	**1.0700**	<0.0079	**0.7100**	**0.2480**	**0.462**	**1.3900**	**0.178**	**0.26**	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0198	<0.0079	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	<0.008	**0.0190**	<0.008	<0.008	**0.9700**	-	-
23-Oct-21	EB2130810019	-	MW32	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.4290**	**0.517**	**4.1**	**0.178**	**1.0400**	<0.0080	**0.1640**	**0.266**	**1.0400**	**0.138**	**0.216**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0200	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	**0.0340**	<0.008	<0.008	**0.8.1200**	-	-
20-Jan-22	EB2029169040	-	MW32	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.4890**	**0.759**	**3.79**	**0.223**	**1.2400**	<0.0030	**0.5300**	**0.1840**	**0.262**	**1.0700**	**0.138**	**0.209**	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0075	<0.0030	<0.007	<0.007	<0.007	<0.007	<0.0030	<0.0030	<0.003	**0.0050**	<0.003	<0.003	**8.3700**	-	-
30-Mar-22	EB2092253016	-	MW32	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.6260**	**0.792**	**4.62**	**0.187**	**1.4900**	<0.0005	**0.1100**	**0.1390**	**0.312**	**1.2900**	**0.138**	**0.253**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0198	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0030**	<0.001	<0.001	**8.9500**	-	-
08-Jul-22	EB2220051030	-	MW32	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.5130**	**0.635**	**4.21**	**0.179**	**1.1700**	<0.0079	**0.3800**	**0.1780**	**0.265**	**0.9550**	**0.141**	**0.241**	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0198	<0.0079	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	<0.008	<0.016	<0.008	<0.008	**8.4900**	-	-
31-Oct-22	EB2320600035	-	MW32	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.4840**	**0.642**	**4.04**	**0.131**	**0.9880**	<0.0079	**0.5300**	**0.1940**	**0.198**	**1.1300**	**0.132**	**0.183**	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0198	<0.0079	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	<0.008	<0.008	<0.008	<0.008	**8.1200**	-	-
04-Mar-23	EB2306934034	-	MW32	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.6200**	**0.795**	**4.99**	**0.222**	**1.2500**	<0.0005	**0.2400**	**0.2010**	**0.306**	**1.1500**	**0.134**	**0.24**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0194	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0030**	<0.001	<0.001	**9.9100**	-	-
10-Jun-23	EB2318365014	-	MW32	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.5350**	**0.955**	**4.34**	**0.162**	**0.9280**	<0.0032	**0.2700**	**0.2150**	**0.286**	**1.1100**	**0.157**	**0.212**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0081	<0.0032	<0.0081	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.0110**	<0.003	<0.003	**9.9100**	-	-
07-Sep-23	EB2328001008	-	MW32	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.7620**	**1.11**	**4.15**	**0.144**	**1.2100**	<0.0005	**0.3600**	**0.2490**	**0.328**	**1.3200**	**0.174**	**0.274**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0015	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0060**	<0.001	<0.001	**9.7300**	-	-
08-Dec-23	EB2339753019	-	MW32	Offsite - Adjacent to ESCA	Groundwater	Standard	-	**0.8160**	**0.763**	**5**	**0.189**	**1.5900**	<0.0032	**0.8900**	**0.2320**	**0.368**	**1.6800**	**0.2**	**0.268**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.0130**	<0.003	<0.003	**10.5000**	-	-
28-Feb-21	EB2105661039	-	MW33	Offsite - Adjacent to ESCA	Groundwater	Standard	-	<0.0016	**0.0019**	**0.03**	**0.0017**	**0.0228**	<0.0016	**0.0528**	<0.0020	**0.0021**	**0.0017**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0040**	<0.002	<0.002	**0.0642**	-	-
12-Dec-23	EB2339753020	-	MW33	Offsite - Adjacent to ESCA	Groundwater	Standard	-	<0.0005	**0.0018**	**0.0315**	<0.0015	**0.0246**	<0.0005	**0.0561**	<0.0020	**0.0008**	**0.0042**	**0.0011**	**0.001**	**0.0007**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0280**	<0.002	<0.002	**0.0937**	-	-
20-Feb-21	EB2104890017	-	MW40	Onsite - WSCA	Groundwater	Standard	-	**0.0356**	**0.0271**	**0.161**	**0.0105**	**0.2920**	<0.0016	**0.4530**	**0.0091**	<0.0016	**0.0029**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0150**	<0.002	<0.002	**0.5570**	-	-
20-Oct-21	EB2130810020	-	MW40	Onsite - WSCA	Groundwater	Standard	-	**0.0485**	**0.0309**	**0.223**	**0.0134**	**0.3210**	<0.0016	**0.5440**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.1200**	<0.002	<0.002	**0.7570**	-	-
21-Jan-22	EB2029861011	-	MW40	Onsite - WSCA	Groundwater	Standard	-	**0.0474**	**0.0346**	**0.222**	**0.0166**	**0.4120**	<0.0032	**0.6340**	<0.0159	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0081	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.0100**	<0.003	<0.003	**0.7460**	-	-
02-Apr-22	EB2092243044	-	MW40	Onsite - WSCA	Groundwater	Standard	-	**0.0493**	**0.0353**	**0.231**	**0.012**	**0.3990**	<0.0005	**0.6300**	<0.0080	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T2: Groundwater and Surface Water Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Company	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (µg/L)	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)						Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)									Perfluoroalkyl Sulfonamides (µg/L)						Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)		
								PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)							-	-	-	-	-	**0.0002**	-	-	-	-	-	-	**19**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)							-	-	-	-	-	**0.1300**	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water							-	-	-	-	-	-	-	**0.0700**	-	-	-	-	**0.56**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water							-	-	-	-	-	-	-	**2.0000**	-	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L) - Standard Analysis							20-500	0.001	0.001	0.001	0.001	0.0001	0.001	0.0010	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005	-	-
Laboratory Level of Reporting (µg/L) - TOPA							-	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.002
14-Jul-22	EB2220736612	-	MW70	Downstream (1.5km)	Groundwater	Standard	-	<0.0005	<0.0005	**0.0016**	<0.0005	**0.0043**	<0.0005	**0.0059**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0005	<0.004	<0.004	<0.001	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0059**	-	-
27-Oct-22	EB2232600022	-	MW70	Downstream (1.5km)	Groundwater	Standard	-	**0.0016**	**0.0007**	**0.0113**	**0.0006**	**0.0043**	<0.0005	**0.0059**	<0.0080	<0.0005	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.001	<0.002	<0.001	<0.001	**0.0545**	-	-
07-Mar-23	EB2306934046	-	MW70	Downstream (1.5km)	Groundwater	Standard	-	**0.0015**	**0.0011**	**0.0111**	**0.0006**	**0.0636**	<0.0005	**0.0747**	<0.0080	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0016	<0.001	<0.001	<0.001	<0.001	**0.0779**	-	-
13-Jun-23	EB2318365023	-	MW70	Downstream (1.5km)	Groundwater	Standard	-	**0.0019**	**0.0011**	**0.0153**	**0.0007**	**0.0543**	<0.0005	**0.0696**	<0.0079	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0733**	-	-
12-Dec-23	EB2339753029	-	MW70	Downstream (1.5km)	Groundwater	Standard	-	**0.0014**	**0.001**	**0.0109**	<0.0005	**0.0483**	<0.0005	**0.0602**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0040	<0.0005	<0.004	<0.004	<0.001	<0.004	<0.001	<0.0005	<0.0016	<0.001	<0.001	<0.001	<0.001	**0.0626**	-	-
05-Mar-21	EB2106358006	-	MW71	Downstream (2.0km)	Groundwater	Standard	<20	**0.0019**	**0.0021**	**0.0246**	**0.0015**	**0.1170**	<0.0005	**0.1420**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1470**	-	-
05-Mar-21	EB2106981001	-	MW71	Downstream (2.0km)	Groundwater	TOPA	-	<0.002	**0.002**	**0.022**	<0.002	**0.1200**	<0.002	**0.1420**	<0.01	<0.002	**0.002**	**0.0190**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.1650**	**0.1650**	**0.106**
07-Apr-21	EB2109607007	-	MW71	Downstream (2.0km)	Groundwater	Standard	-	**0.0016**	**0.0016**	**0.0171**	**0.001**	**0.0724**	<0.0005	**0.0895**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0070**	<0.001	<0.001	**0.1010**	-	-
19-Jan-21	EB2101853003	-	MW72	Downstream (1.6km)	Groundwater	Standard	<20	<0.0005	<0.0005	**0.0022**	<0.0005	**0.0050**	<0.0005	**0.0072**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0072**	-	-
19-Jan-21	EB2101853003	-	MW72	Offsite - Adjacent to SSCA	Groundwater	TOPA	-	<0.002	<0.002	**0.004**	<0.002	**0.0070**	<0.002	**0.0110**	<0.01	<0.002	**0.002**	**0.0060**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.0170**	**0.0170**	**0.011**
20-Feb-21	EB2104859019	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	<0.0005	<0.0005	**0.002**	<0.0005	**0.0039**	<0.0005	**0.0059**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0059**	-	-
08-Apr-21	EB2109607008	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	**0.0010**	**0.0008**	**0.0065**	<0.0005	**0.0096**	<0.0005	**0.0161**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0010**	<0.001	<0.001	**0.0189**	-	-
17-May-21	EB2114060005	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	**0.0006**	<0.0005	**0.0043**	<0.0005	**0.0085**	<0.0005	**0.0128**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0134**	-	-
28-May-21	EB2115500010	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	**0.0007**	<0.0005	**0.0044**	<0.0005	**0.0084**	<0.0005	**0.0128**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0135**	-	-
26-Oct-21	EB2113810027	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	**0.0005**	<0.0005	**0.0037**	<0.0005	**0.0055**	<0.0005	**0.0092**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0097**	-	-
15-Dec-21	EB2137227002	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	**0.0023**	**0.0012**	**0.0089**	<0.0005	**0.0071**	<0.0005	**0.0160**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0195**	-	-
19-Jan-22	EB2202169030	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	<0.0008	<0.0008	**0.0053**	<0.0008	**0.0113**	<0.0008	**0.0166**	<0.0040	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0166**	-	-
30-Mar-22	EB2209243015	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	**0.0007**	<0.0005	**0.0037**	<0.0005	**0.0088**	<0.0005	**0.0125**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0132**	-	-
08-Jul-22	EB2220051028	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	<0.0007	<0.0005	**0.0032**	<0.0005	**0.0047**	<0.0005	**0.0079**	<0.0074	<0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0015	<0.0015	<0.0037	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0079**	-	-
29-Oct-22	EB2232600033	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	**0.0011**	<0.0005	**0.004**	<0.0005	**0.0035**	<0.0005	**0.0075**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0010**	<0.001	<0.001	**0.0096**	-	-
02-Mar-23	EB2306934020	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	<0.0005	<0.0005	**0.0018**	<0.0005	**0.0047**	<0.0005	**0.0065**	<0.0079	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0065**	-	-
07-Jun-23	EB2318365024	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	<0.0016	<0.0005	**0.0034**	<0.0005	**0.0074**	<0.0005	**0.0108**	<0.0079	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0039	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0108**	-	-
04-Sep-23	EB2328001015	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	**0.0007**	<0.0005	**0.0019**	<0.0005	**0.0041**	<0.0005	**0.0060**	<0.0078	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.001	<0.001	<0.001	<0.001	**0.0067**	-	-
11-Dec-23	EB2339753030	-	MW72	Downstream (1.6km)	Groundwater	Standard	-	<0.0010	<0.0005	**0.0030**	<0.0005	**0.0066**	<0.0005	**0.0102**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0102**	-	-
19-Jan-21	EB2101853001	-	MW73	Downstream (4.2km)	Groundwater	Standard	<20	**0.0016**	**0.0028**	**0.0327**	**0.0017**	**0.0762**	<0.0008	**0.1090**	<0.0038	**0.0009**	**0.0018**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0019	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.0090**	<0.001	<0.001	**0.1270**	-	-
19-Jan-21	EB2101853005	-	MW73	Downstream (4.2km)	Groundwater	TOPA	-	**0.0020**	<0.002	**0.029**	<0.002	**0.0630**	<0.002	**0.0920**	<0.01	**0.007**	**0.0200**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.1210**	**0.1210**	**0.078**
20-Feb-21	EB2104890021	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0017**	**0.0021**	**0.0256**	**0.0017**	**0.0569**	<0.0005	**0.0825**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0010**	<0.001	<0.001	**0.0890**	-	-
08-Apr-21	EB2109607009	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0025**	**0.0035**	**0.032**	**0.0022**	**0.0826**	<0.0005	**0.0846**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0030**	<0.001	<0.001	**0.0958**	-	-
18-May-21	EB2114060010	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0047**	**0.0063**	**0.0636**	**0.0032**	**0.0838**	<0.0005	**0.1470**	<0.0020	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0019	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.1620**	-	-
28-May-21	EB2115500009	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0059**	**0.0046**	**0.0674**	**0.0028**	**0.0960**	<0.0005	**0.1630**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0020**	<0.001	<0.001	**0.1790**	-	-
23-Oct-21	EB2130810028	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0056**	**0.0051**	**0.0707**	**0.003**	**0.0780**	<0.0005	**0.1490**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0010**	<0.001	<0.001	**0.1630**	-	-
15-Dec-21	EB2137227001	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0064**	**0.0099**	**0.0764**	<0.0032	**0.1180**	<0.0032	**0.1940**	<0.0160	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.2110**	-	-
19-Jan-22	EB2202169027	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0042**	**0.0047**	**0.0784**	**0.006**	**0.1840**	<0.0016	**0.2620**	<0.0078	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.2770**	-	-
30-Mar-22	EB2209243014	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0022**	**0.0023**	**0.0414**	**0.0039**	**0.1730**	<0.0005	**0.2190**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.2280**	-	-
08-Jul-22	EB2220051027	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	<0.0012	**0.0017**	**0.0301**	**0.0037**	**0.1620**	<0.0005	**0.1920**	<0.0075	<0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0015	<0.0015	<0.0038	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1980**	-	-
29-Oct-22	EB2232600030	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0014**	**0.0011**	**0.015**	**0.0014**	**0.0710**	<0.0005	**0.0860**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.001	**0.0020**	<0.001	<0.001	**0.0919**	-	-
02-Mar-23	EB2306934021	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0074**	**0.0057**	**0.0331**	**0.0017**	**0.0969**	<0.0005	**0.1300**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1440**	-	-
07-Jun-23	EB2318365025	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0074**	**0.0075**	**0.0591**	**0.002**	**0.0823**	<0.0005	**0.1410**	<0.0078	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1580**	-	-
05-Sep-23	EB2328001016	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0066**	**0.0069**	**0.0548**	**0.0012**	**0.0707**	<0.0005	**0.1260**	<0.0078	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1400**	-	-
09-Dec-23	EB2339753031	-	MW73	Downstream (4.2km)	Groundwater	Standard	-	**0.0059**	**0.0058**	**0.0562**	**0.0014**	**0.0964**	<0.0005	**0.1550**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1680**	-	-
03-Nov-20	EB2029263066	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	<20	**0.0123**	**0.0058**	**0.0206**	<0.0016	**0.0069**	<0.0016	**0.0275**	<0.0180	<0.0155	**0.0051**	**0.0022**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0025	<0.0016	<0.0016	<0.002	**0.0030**	<0.002	<0.002	**0.0559**	-	-
03-Nov-20	EB2029263066	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	TOPA	-	**0.0070**	**0.003**	**0.012**	<0.002	**0.0080**	<0.002	**0.0200**	**0.0100**	**0.009**	**0.0060**	<0.002	**0.006**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.0610**	**0.0610**	**0.038**
21-Oct-21	EB2130810029	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	-	**0.0201**	**0.0076**	**0.0531**	**0.0013**	**0.0879**	<0.0005	**0.1610**	**0.1160**	**0.086**	**0.0287**	**0.0154**	<0.0005	<0.0005	<0.0005	<0.0005	**0.0033**	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0035**	<0.0005	<0.0005	<0.001	**0.0040**	<0.001	<0.001	**0.3470**	-	-
16-Dec-21	EB2137227010	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	-	**0.0498**	**0.0389**	**0.139**	<0.0032	**0.0179**	<0.0032	**0.1570**	**0.2260**	**0.283**	**0.0894**	**0.0443**	**0.0124**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0700**	-	-
22-Jan-22	EB2201969053	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	-	**0.0063**	**0.0044**	**0.0201**	**0.0008**	**0.0047**	<0.0008	**0.0248**	**0.0271**	**0.0276**	**0.0106**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	**0.0066**	**0.0015**	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.002	**0.0081**	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.1200**	-	-
01-Apr-22	EB2209243036	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	-	**0.0517**	**0.0372**	**0.157**	**0.0059**	**0.0304**	<0.0005	**0.1870**	**0.2450**	**0.238**	**0.0714**	**0.0461**	**0.014**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0030**	<0.002	<0.002	**0.9000**	-	-
15-Jul-22	EB2220736618	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	-	**0.0446**	**0.0398**	**0.134**	<0.0047	**0.0146**	<0.0008	**0.1490**	**0.2130**	**0.185**	**0.0769**	**0.0559**	**0.0108**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.7750**	-	-
02-Nov-22	EB2232807007	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	-	**0.1070**	**0.0373**	**0.13**	<0.0045	**0.0204**	<0.0008	**0.1500**	**0.2650**	**0.346**	**0.1280**	**0.0444**	**0.0113**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**1.1400**	-	-
02-Mar-23	EB2306934017	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	-	**0.2170**	**0.15**	**0.364**	**0.0032**	**0.0199**	<0.0016	**0.3840**	**0.9540**	**2.24**	**0.9260**	**0.175**	**0.0175**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0020**	<0.002	<0.002	**0.5700**	-	-
12-Jun-23	EB2318365026	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	-	**0.1920**	**0.101**	**0.364**	**0.0029**	**0.0150**	<0.0005	**0.3790**	**0.8900**	**2.19**	**0.7880**	**0.153**	**0.0128**	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0020**	<0.001	<0.001	**4.7100**	-	-
06-Sep-23	EB2328001017	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	-	**0.1940**	**0.0963**	**0.354**	**0.0063**	**0.0224**	<0.0005	**0.3760**	**1.0200**	**1.9**	**0.7700**	**0.18**	**0.0144**	**0.0097**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	**0.0010**	<0.001	<0.001	**4.5600**	-	-
07-Dec-23	EB2339753032	-	MW74	Onsite - Northern Boundary (Upgradient)	Groundwater	Standard	-	**0.1460**	**0.0764**	**0.3**	**0.0036**	**0.0240**	<0.0005	**0.3240**	**0.5670**	**1.17**	**0.5390**	**0.139**	**0.0141**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0070**	<0.001	<0.001	**2.9900**	-	-
02-Mar-21	EB2106063005	-	MW75	Onsite - Evaporation Ponds	Groundwater	Standard	-	**0.0034**	**0.0009**	**0.0045**	<0.0005	**0.0009**	<0.0005	**0.0054**	<0.0060	<0.0010	<0.0015	<0.0005	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0030**	<0.001	<0.001	**0.0133**	-	-
21-Oct-21	EB2130810030	-	MW75	Onsite - Evaporation Ponds	Groundwater	Standard	-	**0.0023**	<0.0005	**0.0031**	<0.0005	**0.0012**	<0.0005	**0.0043**	<0.0150	<0.0005	**0.0011**	<0.0005	<0.0005	<0.0005	**0.0007**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0050**	<0.001	<0.001	**0.0134**	-	-
24-Jan-22	EB2202169058	-	MW75	Onsite - Evaporation Ponds	Groundwater	Standard	-	**0.0025**	<0.0005	**0.003**	<0.0005	<0.0014	<0.0005	**0.0030**	<0.0020	<0.0005	**0.0011**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0008	<0

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T2: Groundwater and Surface Water Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Company	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (µg/L)	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)						Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)										Perfluoroalkyl Sulfonamides (µg/L)						Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)		
								PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)							-	-	-	-	-	**0.0002**	-	-	-	-	-	-	**19**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)							-	-	-	-	-	**0.1300**	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water							-	-	-	-	-	-	-	**0.0700**	-	-	-	-	**0.56**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water							-	-	-	-	-	-	-	**2.0000**	-	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L) - Standard Analysis							20-500	0.001	0.001	0.001	0.001	0.0001	0.001	0.0010	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005	-	-
Laboratory Level of Reporting (µg/L) - TOPA							-	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.002
08-Sep-23	EB2328001029	-	MW97	Callide A - Ash Dam 2	Groundwater	Standard	-	<0.0555	**0.0026**	**0.0106**	<0.0005	**0.0205**	<0.0005	**0.0311**	<0.0080	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.004	<0.004	<0.001	<0.004	<0.0005	<0.0016	<0.001	<0.002	<0.001	<0.001	**0.0337**	-	-
15-Aug-23	EB2325216006	GHD	MW98	Onsite - WSCA	Groundwater	Standard	<20	<0.0095	**0.0054**	**0.0591**	**0.0015**	**0.0400**	<0.0005	**0.0991**	<0.0080	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1060**	-	-
15-Aug-23	EB2325216006	GHD	MW98	Onsite - WSCA	Groundwater	TOPA	-	**0.0040**	**0.006**	**0.067**	<0.002	**0.0270**	<0.002	**0.0940**	<0.01	<0.002	<0.002	<0.002	**0.0100**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	**0.1140**	**0.0710**	**0.114**
08-Sep-23	EB2328001030	-	MW98	Onsite - WSCA	Groundwater	Standard	-	<0.0440	**0.0071**	**0.0858**	**0.0021**	**0.0647**	<0.0005	**0.1500**	<0.0078	<0.0016	<0.0005	<0.0005	**0.0013**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.004	<0.004	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0020**	<0.001	<0.001	**0.1630**	-	-
07-Dec-23	EB2339753044	-	MW98	Onsite - WSCA	Groundwater	Standard	-	<0.0195	**0.0075**	**0.0798**	**0.0022**	**0.0535**	<0.0005	**0.1330**	<0.0020	<0.0005	<0.0005	<0.0005	**0.0008**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0020**	<0.002	<0.002	**0.1440**	-	-
03-Nov-20	EB2029283667	-	ESC1	Onsite - ESCA	Groundwater	Standard	<200	<0.0153	<0.0153	<0.0153	**0.0321**	<0.0153	**0.0230**	<0.0153	**0.0551**	<0.0765	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0383	<0.0153	<0.038	<0.038	<0.038	<0.038	<0.0153	<0.0153	<0.015	<0.015	<0.015	<0.015	**0.0651**	-	-
03-Nov-20	EB2029283667	-	ESC1	Onsite - ESCA	Groundwater	TOPA	-	**0.0170**	<0.010	**0.047**	<0.010	<0.032	<0.010	**<0.0579**	**0.0100**	**0.011**	**0.0100**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025	<0.010	<0.025	<0.025	<0.025	<0.025	<0.025	<0.010	<0.010	<0.010	<0.010	<0.010	**0.0950**	**0.0950**	**0.059**
20-Jan-21	EB2101853010	-	ESC1	Onsite - ESCA	Groundwater	Standard	**20**	**0.0085**	**0.0055**	**0.0303**	<0.0008	**0.0271**	<0.0008	**0.0574**	<0.0060	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	**0.001**	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0724**	-	-
20-Jan-21	EB2101853010	-	ESC1	Onsite - ESCA	Groundwater	TOPA	-	**0.0090**	**0.004**	**0.028**	<0.002	**0.0260**	<0.002	**0.0540**	<0.01	**0.003**	**0.0060**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	**0.0760**	**0.0760**	**0.048**
02-Nov-20	EB2029283665	-	ESC3	Onsite - ESCA	Groundwater	Standard	<20	**0.0144**	**0.0067**	**0.0338**	<0.0016	**0.0240**	<0.0016	**0.0578**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0210**	<0.002	<0.002	**0.0999**	-	-
02-Nov-20	EB2029283665	-	ESC3	Onsite - ESCA	Groundwater	TOPA	-	**0.0220**	**0.01**	**0.052**	<0.002	**0.0420**	<0.002	**0.0940**	**0.0200**	**0.005**	**0.0090**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	**0.1600**	**0.1600**	**0.099**
20-Jan-21	EB2101853011	-	ESC3	Onsite - ESCA	Groundwater	Standard	<20	**0.0226**	**0.0073**	**0.0346**	**0.0012**	**0.0278**	<0.0005	**0.0624**	**0.0112**	<0.0005	**0.0007**	<0.0005	<0.0005	**0.0014**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0060**	<0.001	<0.001	**0.1130**	-	-
19-Jan-21	EB2101853011	-	ESC3	Onsite - ESCA	Groundwater	TOPA	-	**0.0150**	**0.006**	**0.034**	<0.002	**0.0270**	<0.002	**0.0610**	**0.0200**	**0.004**	**0.0080**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	**0.1140**	**0.1140**	**0.071**
20-Oct-21	EB2130810014	-	ESC3	Onsite - ESCA	Groundwater	Standard	-	**0.0135**	<0.0080	**0.0366**	<0.0080	**0.0343**	<0.0080	**0.0709**	<0.0398	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0199	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	**0.0210**	<0.008	<0.008	**0.1050**	-	-
20-Jan-21	EB2029169045	-	ESC3	Onsite - ESCA	Groundwater	Standard	-	**0.0143**	**0.0078**	**0.039**	<0.0016	**0.0318**	<0.0016	**0.0788**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	**0.0016**	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0070**	<0.002	<0.002	**0.1020**	-	-
01-Apr-22	EB2209243039	-	ESC3	Onsite - ESCA	Groundwater	Standard	-	**0.0153**	**0.009**	**0.0596**	**0.0014**	**0.0341**	<0.0005	**0.0937**	<0.0081	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	**0.001**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1200**	-	-
09-Jul-22	EB2220051033	-	ESC3	Onsite - ESCA	Groundwater	Standard	-	**0.0167**	<0.0107	**0.0643**	<0.0016	**0.0490**	<0.0005	**0.1130**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0005	<0.0007	<0.0005	<0.0005	<0.0016	<0.0016	<0.0040	<0.0005	<0.004	<0.004	<0.001	<0.001	<0.0005	<0.0005	<0.002	<0.001	<0.001	<0.001	**0.1300**	-	-
26-Oct-22	EB2232600026	-	ESC3	Onsite - ESCA	Groundwater	Standard	-	**0.0166**	**0.0115**	**0.0643**	<0.0016	**0.0515**	<0.0016	**0.0968**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.1240**	-	-
02-Mar-23	EB2306934018	-	ESC3	Onsite - ESCA	Groundwater	Standard	-	**0.0140**	<0.0065	**0.042**	<0.0016	**0.0273**	<0.0016	**0.0693**	<0.0078	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0833**	-	-
08-Jun-23	EB2318365002	-	ESC3	Onsite - ESCA	Groundwater	Standard	-	**0.0115**	**0.0078**	**0.0423**	**0.001**	**0.0243**	<0.0005	**0.0666**	<0.0084	<0.0016	<0.0016	<0.0016	<0.0016	**0.0015**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.004	<0.004	<0.001	<0.001	<0.0005	<0.0005	<0.002	<0.001	<0.001	<0.001	**0.0884**	-	-
06-Dec-23	EB2339753011	-	ESC3	Onsite - ESCA	Groundwater	Standard	-	**0.0169**	**0.0083**	**0.0451**	**0.0013**	**0.0288**	<0.0005	**0.0739**	<0.0079	<0.0016	<0.0005	<0.0005	<0.0005	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1020**	-	-
03-Apr-22	EB2209243050	-	ESC4	Onsite - ESCA	Groundwater	Standard	-	**0.0747**	**0.0847**	**0.519**	**0.0102**	**0.0991**	<0.0005	**0.6180**	**0.0378**	**0.0062**	**0.0158**	**0.003**	**0.0082**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0590**	-	-
09-Jul-22	EB2220051034	-	ESC4	Onsite - ESCA	Groundwater	Standard	-	**0.0314**	**0.0312**	**0.167**	<0.0062	**0.0658**	<0.0005	**0.2230**	<0.0159	<0.0032	<0.0032	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0079	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.2850**	-	-
27-Oct-22	EB2232600018	-	ESC4	Onsite - ESCA	Groundwater	Standard	-	**0.0281**	**0.0231**	**0.177**	**0.0043**	**0.0471**	<0.0016	**0.2170**	**0.0084**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.2810**	-	-
03-Mar-23	EB2306934026	-	ESC4	Onsite - ESCA	Groundwater	Standard	-	**0.0348**	**0.0331**	**0.197**	**0.0066**	**0.0716**	<0.0005	**0.2690**	<0.0079	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.3430**	-	-
12-Jan-23	EB2318365003	-	ESC4	Onsite - ESCA	Groundwater	Standard	-	**0.0284**	**0.0286**	**0.186**	**0.0049**	**0.0412**	<0.0016	**0.2370**	<0.0159	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.3000**	-	-
06-Sep-23	EB2328001002	-	ESC4	Onsite - ESCA	Groundwater	Standard	-	**0.0288**	**0.0261**	**0.151**	**0.0028**	**0.0498**	<0.0005	**0.2010**	<0.0112	<0.0016	<0.0016	<0.0016	<0.0016	<0.0005	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.001	<0.001	<0.001	<0.001	**0.2580**	-	-
07-Dec-23	EB2339753012	-	ESC4	Onsite - ESCA	Groundwater	Standard	-	**0.0287**	**0.0244**	**0.135**	**0.0052**	**0.0544**	<0.0005	**0.1890**	<0.0080	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.2480**	-	-
14-Jun-23	EB2318365001	-	Bore X	Onsite - Western Boundary	Groundwater	Standard	-	**0.0137**	**0.005**	**0.028**	<0.0016	**0.0117**	<0.0005	**0.0397**	<0.0080	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0584**	-	-
28-Oct-21	EB2130810044	-	RN13030692	Downstream (4.9km)	Groundwater	Standard	-	<0.0016	<0.0016	**0.0072**	<0.0016	**0.0196**	<0.0016	**0.0268**	<0.0078	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0040**	<0.002	<0.002	**0.0308**	-	-
18-Jan-22	EB2202169013	-	RN13030692	Downstream (4.9km)	Groundwater	Standard	-	<0.0016	<0.0016	**0.0085**	<0.0016	**0.0206**	<0.0016	**0.0291**	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0040**	<0.002	<0.002	**0.0331**	-	-
29-Mar-22	EB2209243004	-	RN13030692	Downstream (4.9km)	Groundwater	Standard	-	**0.0006**	<0.0005	**0.0039**	<0.0005	**0.0308**	<0.0005	**0.0347**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0353**	-	-
07-Jul-22	EB2220051026	-	RN13030692	Downstream (4.9km)	Groundwater	Standard	-	**0.0005**	<0.0005	**0.0039**	<0.0005	**0.0131**	<0.0005	**0.0179**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0175**	-	-
26-Oct-22	EB2232600015	-	RN13030692	Downstream (4.9km)	Groundwater	Standard	-	**0.0039**	<0.0005	**0.006**	<0.0005	**0.0210**	<0.0005	**0.0171**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0040**	<0.001	<0.001	**0.0230**	-	-
01-Mar-23	EB2306934012	-	RN13030692	Downstream (4.9km)	Groundwater	Standard	-	**0.0005**	<0.0005	**0.0062**	<0.0005	**0.0199**	<0.0005	**0.0261**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0272**	-	-
09-Jun-23	EB2318365035	-	RN13030692	Downstream (4.9km)	Groundwater	Standard	-	<0.0005	<0.0005	**0.0063**	<0.0005	**0.0159**	<0.0005	**0.0222**	<0.0078	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0222**	-	-
05-Sep-23	EB2328001034	-	RN13030692	Downstream (4.9km)	Groundwater	Standard	-	<0.0005	<0.0005	**0.006**	<0.0005	**0.0210**	<0.0005	**0.0270**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0270**	-	-
08-Dec-23	EB2339753046	-	RN13030692	Downstream (4.9km)	Groundwater	Standard	-	<0.0005	<0.0005	**0.0046**	<0.0005	**0.0189**	<0.0005	**0.0235**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0235**	-	-
24-Oct-21	EB2130810045	-	RN13030697	Downstream (6.7km)	Groundwater	Standard	-	**0.0101**	**0.0119**	**0.164**	<0.0016	<0.0126	<0.0016	**0.1640**	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0130**	<0.002	<0.002	**0.1990**	-	-
19-Jan-22	EB2202169023	-	RN13030697	Downstream (6.7km)	Groundwater	Standard	-	**0.0107**	**0.0167**	**0.153**	<0.0016	**0.0298**	<0.0016	**0.1530**	<0.0081	**0.0047**	**0.0025**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0120**	<0.002	<0.002	**0.2000**	-	-
30-Mar-22	EB2209243005	-	RN13030697	Downstream (6.7km)	Groundwater	Standard	-	<0.0160	**0.0255**	**0.204**	<0.0160	<0.0655	<0.0160	**0.2040**	<0.0798	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0399	<0.0160	<0.040	<0.040	<0.040	<0.040	<0.0160	<0.0160	<0.016	<0.016	<0.016	<0.016	**0.2300**	-	-
03-Nov-22	EB2232870012	-	RN13030697	Downstream (6.7km)	Groundwater	Standard	-	<0.0095	**0.0146**	**0.164**	**0.0042**	**0.0376**	<0.0005	**0.1920**	<0.0020	**0.0014**	**0.0060**	**0.0007**	**0.0017**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0008	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.3140**	<0.001	<0.001	**0.5340**	-	-
06-Mar-23	EB2306934037	-	RN13030697	Downstream (6.7km)	Groundwater	Standard	-	<0.0159	<0.0159	**0.102**	<0.0159	**0.0541**	<0.0159	**0.1560**	<0.0794	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0397	<0.0159	<0.040	<0.040	<0.040	<0.040	<0.0159	<0.0159	<0.016	**0.0460**	<0.016	<0.016	**0.2320**	-	-
10-Jun-23	EB2318365036	-	RN13030697	Downstream (6.7km)	Groundwater	Standard	-	**0.0123**	**0.01**	**0.102**	**0.0038**	**0.0570**	<0.0005	**0.1590**	<0.0078	**0.004**	**0.0025**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0020**	<0.001	<0.001	**0.1940**	-	-
06-Sep-23	EB2328001035	-	RN13030697	Downstream (6.7km)	Groundwater	Standard	-	<0.0325	**0.0076**	**0.0868**	**0.0039**	**0.0680**	<0.0005	**0.1550**	<0.0079	**0.0058**	**0.0038**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0080**	<0.001	<0.001	**0.2140**	-	-
09-Dec-23	EB2339753047	-	RN13030697	Downstream (6.7km)	Groundwater	Standard	-	<0.0130	**0.0091**	**0.0801**	<0.0035	**0.0831**	<0.0005	**0.1630**	<0.0020	**0.0066**	**0.0026**	<0.0005	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1820**	-	-
23-Feb-22	EB2205271007	-	RN13030727	Downstream (6.9km)	Groundwater	Standard	-	**0.0082**	**0.0072**	**0.0557**	**0.0008**	**0.0684**	<0.0005	**0.0641**	<0.0020	<0.0005	<0.0005	**0.0010**	<0.0005	**0.0008**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0160**	<0.001	<0.001	**0.0981**	-	-
07-Apr-22	EB2209861004	-	RN13030727	Downstream (6.9km)	Groundwater	Standard	-	<0.0126	<0.0126	<0.0126	**0.0016**	<0.0126	<0.0126	**0.0616**	<0.0629	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0314	<0.0126	<0.031	<0.031	<0.031	<0.031	<0.0126	<0.0126	<0.012	<0.012	<0.012	<0.012	**0.0616**	-	-
03-Nov-22	EB2232870010	-	RN13030727	Downstream (6.9km)	Groundwater	Standard	-	**0.0042**	**0.0059**	**0.053**	<0.0015	**0.0098**	<0.0008	**0.0628**	<0.0040	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.0960**	<0.001	<0.001	**0.1690**	-	-
07-Mar-23	EB2306934043	-	RN13030727	Downstream (6.9km)	Groundwater	Standard	-	**0.0071**	**0.0058**	**0.0521**	**0.0031**	**0.0132**	<0.0031	**0.0663**	<0.0154	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0077	<0.0031	<0.077	<0.077	<0.008	<0.008	<0.0031	<0.0031	<0.003	**0.0600**	<0.003	<0.003	**0.1380**	-	-
13-Apr-23	EB2311153015	-	RN13030727	Downstream (6.9km)	Groundwater	Standard	-	**0.0041**	**0.0039**	**0.0475**	**0.001**	**0.0080**	<0.0005	**0.0555**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0220**	<0.001	<0.001	**0.1250**	-	-
10-Jun-23	EB2318365034	-	RN13030727	Downstream (6.9km)	Groundwater	Standard	-	<0.0215	**0.0046**	**0.0532**	**0.0011**	**0.0130**	<0.0005	**0.0662**	<0.0078	<0.0016	**0.0009**	<0.0016	**0.0005**	<0.0005	<0.0005	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.0005	**0.0370**	<0.001	<0.001	**0.1100**	-	-
06-Sep-23	EB2328001033	-	RN13030727	Downstream (6.9km)	Groundwater	Standard	-	<0.0290	**0.0027**	**0.0446**	**0.0007**	**0.0163**	<0.0005	**0.0509**	<0.0020	<0.0005	**0.0011**	<0.0005	<0.0005	**0.0009**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0120**	<0.001	<0.001	**0.0783**	-	-
26-Oct-21	EB2130810043	-	RN13030126	Downstream (7.0km)	Groundwater	Standard	-	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0075	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0038	<0.0015	<0.004	<0.004	<0.004	<0.004	<0.0015	<0.0015	<0.002	**0.0030**	<0.002	<0.002	**0.0624**	-	-
19-Jan-22	EB2202169022	-	RN13030126	Downstream (7.0km)	Groundwater	Standard	-	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.0016	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0100**	<0.002	<0.002	**0.0100**	-	-
29-Mar-22	EB2209243003	-	RN13030126	Downstream (7.0km)	Groundwater	Standard	-	<0.0005	<0.0005	**0.0044**	<0.0005	**0.0052**	<0.0005	**0.0096**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0096**	-	-
14-Jul-22	EB2220736017	-	RN13030126	Downstream (7.0km)	Groundwater	Standard	-	<0.0005	<0.0005	**0.0013**	<0.0005	**0.0018**	<0.0005	**0.0031**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0031**	-	-
29-Oct-22	EB2232600034	-	RN13030126	Downstream (7.0km)	Groundwater	Standard	-	<0.

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T2: Groundwater and Surface Water Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Company	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (µg/L)	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)						Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)										Perfluoroalkyl Sulfonamides (µg/L)							Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)		
								PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)							-	-	-	-	-	**0.0002**	-	-	-	-	-	-	**19**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)							-	-	-	-	-	**0.1300**	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water							-	-	-	-	-	-	-	**0.0700**	-	-	-	-	**0.56**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water							-	-	-	-	-	-	-	**2.0000**	-	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L) - Standard Analysis							20-500	0.001	0.001	0.001	0.001	0.0001	0.001	0.0010	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005	-	-
Laboratory Level of Reporting (µg/L) - TOPA							-	0.002	0.002	0.002	0.002	0.002	0.020	0.002	0.010	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.002
26-Oct-22	EB2232600014	-	SW02	Callide Creek adjacent to SSCA	Surface Water	Standard	-	**0.0024**	<0.0016	**0.0027**	<0.0016	<0.0016	<0.0016	**0.0027**	<0.0080	<0.0016	<0.0016	<0.0020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0051**	-	-
28-Feb-23	EB2306934008	-	SW02	Callide Creek adjacent to SSCA	Surface Water	Standard	-	**0.0072**	**0.0043**	**0.0225**	<0.0005	**0.0059**	<0.0005	**0.0284**	<0.0080	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.001	<0.001	<0.001	<0.001	**0.0399**	-	-
12-Jun-23	EB2318365044	-	SW02	Callide Creek adjacent to SSCA	Surface Water	Standard	-	**0.0058**	<0.0005	**0.0019**	<0.0005	**0.0004**	<0.0005	**0.0023**	<0.0078	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0081**	-	-
03-Nov-20	EB2029263664	-	SW03	Onsite - WSCP	Surface Water	Standard	<20	**0.0466**	**0.0342**	**0.183**	**0.0086**	**0.2140**	<0.0016	**0.3970**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.4860**	-	-
03-Nov-20	EB2029263664	-	SW03	Onsite - WSCP	TOPA	-	-	**0.0700**	**0.044**	**0.265**	**0.007**	**0.2400**	<0.002	**0.5000**	**0.0200**	**0.016**	**0.1060**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	**0.7710**	**0.7710**	**0.484**
12-Nov-21	EB2133062606	CS Energy	SW03	Onsite - WSCP	Surface Water	Standard	-	**0.0045**	<0.0032	**0.0077**	<0.0032	**0.0112**	<0.0032	**0.0189**	<0.016	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0234**	-	-
12-Nov-21	EB2133259039	CS Energy	SW03	Onsite - WSCP	Surface Water	Standard	-	**0.0020**	<0.0013	**0.0079**	<0.0013	**0.0079**	<0.0013	**0.0158**	<0.0060	<0.0013	<0.0013	<0.0030	<0.0013	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0179**	-	-
24-Nov-21	EB2134705001	CS Energy	SW03	Onsite - WSCP	Surface Water	Standard	-	**0.0023**	<0.0015	**0.0091**	<0.0008	**0.0084**	<0.0008	**0.0175**	<0.0040	<0.0050	<0.0020	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0198**	-	-
29-Nov-21	EB2134705003	CS Energy	SW03	Onsite - WSCP	Surface Water	Standard	-	**0.0032**	<0.0025	**0.0136**	<0.0008	**0.0151**	<0.0008	**0.0287**	<0.0080	<0.0060	<0.0040	<0.0015	**0.0019**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0338**	-	-
03-Dec-21	EB2135800012	CS Energy	SW03	Onsite - WSCP	Surface Water	Standard	-	**0.0017**	<0.0015	**0.009**	<0.0008	**0.0101**	<0.0008	**0.0191**	<0.008	<0.0030	<0.0020	**0.0017**	**0.0008**	**0.001**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0235**	-	-
06-Jul-22	EB2220051006	-	SW03	Onsite - WSCP	Surface Water	Standard	-	**0.0092**	**0.005**	**0.0345**	<0.0010	**0.0366**	<0.0005	**0.0711**	<0.0159	<0.0032	<0.0032	<0.0005	<0.0013	<0.0005	<0.0005	<0.0005	<0.0032	<0.0032	<0.0080	<0.0005	<0.001	<0.008	<0.001	<0.008	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0853**	-	-
22-Jul-22	EB2221968008	CS Energy	SW03	Onsite - WSCP	Surface Water	Standard	-	<0.0042	<0.0020	**0.0121**	<0.0005	**0.0114**	<0.0005	**0.0235**	<0.0160	<0.0032	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0032	<0.0032	<0.0080	<0.0005	<0.008	<0.008	<0.008	<0.008	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0239**	-	-
30-Nov-22	EB2236118016	CS Energy	SW03	Onsite - WSCP	Surface Water	Standard	-	**0.0068**	**0.0038**	**0.0256**	<0.0016	**0.0178**	<0.0016	**0.0444**	<0.0080	**0.0042**	**0.0022**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0604**	-	-
01-Dec-22	EB2236118014	CS Energy	SW03	Onsite - WSCP	Surface Water	Standard	-	**0.0062**	**0.003**	**0.0269**	<0.0016	**0.0192**	<0.0016	**0.0461**	<0.0080	**0.0056**	**0.0027**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0636**	-	-
05-Jan-23	EB2300551009	CS Energy	SW03	Onsite - WSCP	Surface Water	Standard	-	**0.0201**	**0.0109**	**0.0797**	**0.0048**	**0.1230**	<0.0008	**0.2050**	**0.0149**	**0.0012**	**0.0042**	<0.0008	**0.0027**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0019	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.2650**	-	-
04-Nov-20	EB2029263063	-	SW04	Onsite - ESCP	Surface Water	Standard	<20	<0.0080	<0.0080	**0.0408**	<0.0080	**0.0440**	<0.0080	**0.0848**	<0.0400	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0200	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	<0.008	<0.008	<0.008	**0.0848**	-	-
04-Nov-20	EB2029263063	-	SW04	Onsite - ESCP	TOPA	-	-	**0.0160**	**0.008**	**0.055**	<0.002	**0.0500**	<0.002	**0.1050**	<0.01	**0.002**	**0.0070**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.1380**	**0.1380**	**0.086**
17-Nov-21	EB2133256008	CS Energy	SW04	Onsite - ESCP	Surface Water	Standard	-	**0.0111**	**0.0076**	**0.0304**	<0.0032	**0.0254**	<0.0032	**0.0558**	<0.0158	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0079	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0669**	-	-
24-Nov-21	EB2134705002	CS Energy	SW04	Onsite - ESCP	Surface Water	Standard	-	**0.0095**	**0.005**	**0.0323**	**0.0012**	**0.0347**	<0.0005	**0.0670**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0020	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0827**	-	-
29-Nov-21	EB2134705004	CS Energy	SW04	Onsite - ESCP	Surface Water	Standard	-	**0.0019**	<0.0010	**0.0023**	<0.0005	**0.0020**	<0.0005	**0.0043**	<0.0060	<0.0015	<0.0025	<0.0025	**0.0016**	**0.0005**	**0.0009**	<0.0005	<0.0005	<0.0005	<0.0008	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0092**	-	-
06-Jul-22	EB2220051001	-	SW06	Western Stormwater Diversion Channel	Surface Water	Standard	-	**0.0142**	<0.0072	**0.0417**	<0.0008	<0.0362	<0.0008	**0.0417**	<0.0400	<0.0096	**0.0360**	<0.0096	<0.0039	<0.0008	<0.0008	<0.0080	<0.0080	<0.0080	<0.0200	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	<0.008	<0.008	<0.008	**0.1620**	-	-
22-Jul-22	EB2221968011	CS Energy	SW06	Western Stormwater Diversion Channel	Surface Water	Standard	-	<0.0161	<0.0161	**0.0274**	<0.0161	**0.0274**	<0.0161	**0.0548**	<0.0806	**0.071**	**0.0387**	**0.0258**	<0.0161	<0.0161	<0.0161	<0.0161	<0.0161	<0.0161	<0.0403	<0.0161	<0.040	<0.040	<0.040	<0.040	<0.0161	<0.0161	<0.016	<0.016	<0.016	<0.016	**0.1900**	-	-
04-Mar-21	EB2106063014	-	SW08	Cooling Tower Reservoir	Surface Water	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	**0.0004**	<0.0005	**0.0004**	<0.0030	<0.0145	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0004**	-	-
04-Nov-20	EB2029263060	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	<20	**0.0016**	**0.0007**	**0.0037**	<0.0005	**0.0012**	<0.0005	**0.0049**	<0.0720	<0.0025	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0072**	-	-
04-Nov-20	EB2029263060	-	SW12	Callide Creek adjacent to ESCA	TOPA	-	-	<0.002	<0.002	**0.006**	<0.002	<0.002	<0.002	**0.0060**	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.0060**	**0.0060**	**0.004**
20-Jan-21	EB2101853014	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	<20	**0.0009**	**0.0008**	**0.0025**	<0.0008	**0.0014**	<0.0008	**0.0039**	<0.0039	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.002	<0.002	<0.002	<0.002	**0.0056**	-	-
20-Jan-21	EB2102849014	-	SW12	Callide Creek adjacent to ESCA	TOPA	-	-	<0.002	<0.002	**0.005**	<0.008	<0.002	<0.002	**0.0050**	<0.01	**0.002**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.0070**	**0.0070**	**0.004**
18-May-21	EB2114060014	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	<0.0016	<0.0016	**0.003**	<0.0016	<0.0016	<0.0016	**0.0030**	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0030**	-	-
20-May-21	EB2114060036	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016	-	-
28-May-21	EB2115500004	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	**0.0019**	<0.0016	**0.004**	<0.0016	**0.0018**	<0.0016	**0.0058**	<0.0020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0077**	-	-
19-Oct-21	EB2130810047	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	<0.0032	<0.0032	**0.0099**	<0.0032	<0.0032	<0.0032	**0.0099**	<0.0160	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0099**	-	-
12-Nov-21	EB2133062009	CS Energy	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	**0.0032**	<0.0032	**0.0119**	<0.0032	**0.0158**	<0.0032	**0.0334**	<0.016	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0334**	-	-
18-Jan-22	EB2202169008	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016	-	-
31-Mar-22	EB2209321027	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	<0.0040	<0.0025	**0.003**	<0.0005	<0.0014	<0.0005	**0.0030**	<0.0159	<0.0032	<0.0032	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0079	<0.0005	<0.001	<0.008	<0.001	<0.008	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0032	-	-
07-Jul-22	EB2220051023	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	<0.0022	<0.0019	**0.0082**	<0.0008	<0.0030	<0.0008	**0.0082**	<0.0040	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0027**	-	-
26-Oct-22	EB2232600017	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0159	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.0032	-	-
28-Feb-23	EB2306934007	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	**0.0162**	**0.0113**	**0.0615**	<0.0008	**0.0106**	<0.0008	**0.0721**	<0.0080	<0.0040	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.1010**	-	-
07-Jun-23	EB2318365045	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	<0.0005	<0.0005	<0.0012	<0.0005	<0.0002	<0.0005	<0.0002	<0.0078	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	-	-
04-Sep-23	EB2328001038	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	**0.0111**	**0.0096**	**0.0556**	<0.0007	**0.0078**	<0.0005	**0.0634**	<0.0081	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0841**	-	-
05-Dec-23	EB2339753008	-	SW12	Callide Creek adjacent to ESCA	Surface Water	Standard	-	<0.0115	**0.0086**	**0.0514**	**0.0019**	**0.0181**	<0.0005	**0.0775**	<0.0080	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0880**	-	-
20-Oct-21	EB2130810048	-	SW13	Western Seepage Trench	Surface Water	Standard	-	**0.0212**	**0.009**	**0.0748**	<0.0035	**0.0458**	<0.0031	**0.1210**	**0.0253**	**0.0224**	**0.0128**	<0.0066	**0.0044**	<0.0031	<0.0031	<0.0031	<0.0031	<0.0078	<0.0031	<0.008	<0.008	<0.008	<0.008	<0.0031	<0.0031	<0.003	<0.003	<0.003	<0.003	**0.2160**	-	-
19-Jan-22	EB2202169025	-	SW13	Western Seepage Trench	Surface Water	Standard	-	**0.0367**	**0.0282**	**0.155**	**0.0085**	**0.1030**	<0.0008	**0.2080**	<0.0300	<0.0050	<0.0008	<0.0008	**0.0111**	<0.0020	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.3420**	-	-
06-Jul-22	EB2220051007	-	SW13	Western Seepage Trench	Surface Water	Standard	-	**0.0194**	**0.0095**	**0.0561**	<0.0026	**0.0599**	<0.0005	**0.1160**	<0.0159	<0.0102	<0.0064	<0.0016	<0.0022	<0.0005	<0.0005	<0.0005	<0.0032	<0.0032	<0.0080	<0.0005	<0.008	<0.008	<0.008	<0.008	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1450**	-	-
22-Jul-22	EB2221968004	CS Energy	SW13	Western Seepage Trench	Surface Water	Standard	-	<0.0035	<0.0015	**0.0119**	<0.0008	**0.0096**	<0.0008	**0.0215**	<0.0038	<0.0008	<0.0008	<0.0008	<0.0010	<0.0008	<0.0008	<0.0008	<0.0076	<0.0076	<0.0190	<0.0008	<0.019	<0.019	<0.019	<0.019	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0215**	-	-
25-Oct-22	EB2232600008	-	SW13	Western Seepage Trench	Surface Water	Standard	-	**0.0220**	**0.0105**	**0.0777**	**0.0024**	**0.0576**	<0.0016	**0.1150**	**0.0142**	**0.004**	**0.0062**	**0.0027**	**0.0032**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.1500**	-	-
30-Nov-22	EB2236118015	CS Energy	SW13	Western Seepage Trench	Surface Water	Standard	-	**0.0069**	**0.0037**	**0.0251**	<0.0016	**0.0166**	<0.0016	**0.0417**	**0.0104**	**0.0093**	**0.0042**	**0.0021**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0783**	-	-
01-Dec-22	EB2236118013	CS Energy	SW13	Western Seepage Trench	Surface Water	Standard	-	**0.0077**	**0.0051**	**0.0344**	**0.0018**	**0.0376**	<0.0016	**0.0720**	**0.0158**	**0.0237**	**0.0104**	**0.0051**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.1410**	-	-
05-Jan-23	EB2300551010	CS Energy	SW13	Western Seepage Trench	Surface Water	Standard	-	**0.0156**	**0.008**	**0.0576**	**0.0028**	**0.0518**	<0.0005	**0.1090**	<0.0200	<0.0155	<0.0097	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0008	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1530**	-	-
27-Feb-23	EB2306934003	-	SW13	Western Seepage Trench	Surface Water	Standard	-	**0.0592**	**0.0426**	**0.274**	**0.0136**	**0.2810**	<0.0016	**0.5550**	**0.0080**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.6780**	-	-
05-Dec-23	EB2339753005	-	SW13	Western Seepage Trench	Surface Water	Standard	-	**0.0550**	**0.0228**	**0.163**	<0.0080	**0.1480**	<0.0005	**0.3110**	<0.0160	<0.0032	<0.0032	<0.0005	**0.0054**	<0.0016	**0.0072**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.4010**	-	-
26-Mar-21	EB2109623003	CS Energy	SW17	Dunn Creek (Downstream of R2)	Surface Water	Standard	-	**0.0042**	**0.0023**	**0.0171**	<0.0015	**0.0145**	<0.0005	**0.0322**	<0.0262	<0.0175	<0.0115	<0.0005	**0.0035**	**0.0008**	**0.0008**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0515**	-	-
07-Jul-21	EB2119293012	-	SW17	Dunn Creek (Downstream of R2)	Surface Water	Standard	-	**0.0030**	<0.0016	**0.0026**	<0.0016	**0.0030**	<0.0016	**0.0056**	**0.0065**	**0.0045**	<0.0016	**0.0038**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0234**	-	-
01-Dec-23	EB2135660007	CS Energy	SW17	Dunn Creek (Downstream of R2)	Surface Water	Standard	-	**0.0093**	**0.0052**	**0.0286**	<0.0020	**0.0155**	<0.0008	**0.0471**	<0.004	<0.0008	**0.0017**	<0.0008	**0.0062**	<0.0008	**0.0017**	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.1180**	-	-
19-Jan-22	EB2202169021	-	SW17	Dunn Creek (Downstream of R2)	Surface Water	Standard	-	**0.0152**	**0.0078**	**0.0328**	<0.0008	**0.0116**	<0.0008	**0.0444**	<0.0140	**0.014**	<0.0075	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0808**	-	-
10-Mar-22	EB2207080001	CS Energy	SW17	Dunn Creek (Downstream of R2)	Surface Water	Standard	-	<0.0055	<0.0042	**0.0183**	<0.0032	<0.0055	<0.0032	**0.0183**	<0.0160	<0.0061	**0.0061**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0244**	-	-
26-Mar-21	EB2109623002	CS Energy	SW18	Dunn Creek	Surface Water	Standard	-	**0.0172**	**0.0111**	**0.0844**	**0.0062**	**0.1530**	<0.0005	**0.1870**	<0.0360	<0.0256	<0.0150	**0.0042**	**0.0025**	**0.0005**	<0.0005	<0.0005

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T2: Groundwater and Surface Water Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Company	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (µg/L)	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)						Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)									Perfluoroalkyl Sulfonamides (µg/L)							Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)		
								PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)							-	-	-	-	-	0.0002	-	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)							-	-	-	-	-	0.1300	-	-	-	-	-	-	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water							-	-	-	-	-	-	-	0.0700	-	-	-	-	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water							-	-	-	-	-	-	-	2.0000	-	-	-	-	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L) - Standard Analysis							20-500	0.001	0.001	0.001	0.001	0.0001	0.001	0.0010	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005	-	-
Laboratory Level of Reporting (µg/L) - TOP A							-	0.002	0.002	0.002	0.002	0.002	0.020	0.020	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.002
05-Jan-23	EB2300551012	CS Energy	SW35	Western Stormwater Diversion Channel (upstream of SW46)	Surface Water	Standard	-	<0.0080	<0.0080	**0.0152**	<0.0080	<0.0194	<0.0080	**0.0152**	<0.0401	**0.0626**	**0.0353**	**0.0208**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0200	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	<0.008	<0.008	<0.008	**0.1340**		
19-May-21	EB2114060027	-	SW36	Downstream - Dunn Creek	Surface Water	Standard	-	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016	-	-
21-Oct-21	EB2308810069	-	SW36	Downstream - Dunn Creek	Surface Water	Standard	-	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0160	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016	-	-
24-Jan-22	EB2202169057	-	SW36	Downstream - Dunn Creek	Surface Water	Standard	-	<0.0020	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0040	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0008	-	-
31-Mar-22	EB2209243025	-	SW36	Downstream - Dunn Creek	Surface Water	Standard	-	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0039	<0.0008	<0.0008	<0.0008	<0.0010	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0019	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0008	-	-
07-Jul-22	EB2220051022	-	SW36	Downstream - Dunn Creek	Surface Water	Standard	-	<0.0009	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0039	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0019	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0008	-	-
26-Oct-22	EB2308230013	-	SW36	Downstream - Dunn Creek	Surface Water	Standard	-	**0.0295**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	**0.004**	**0.0035**	<0.002	<0.002	<0.002	<0.002	**0.0370**	-	-
28-Feb-23	EB2306934006	-	SW36	Downstream - Dunn Creek	Surface Water	Standard	-	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0040	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0008	-	-
10-Jun-23	EB2318365048	-	SW36	Downstream - Dunn Creek	Surface Water	Standard	-	**0.0026**	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0078	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0026**	-	-
19-May-21	EB2114060019	-	SW37	Upstream - Northwestern Corner	Surface Water	Standard	-	<0.0016	<0.0016	<0.0016	<0.0016	**0.0026**	<0.0016	**0.0026**	**0.0088**	**0.0037**	**0.0038**	**0.0045**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0235**	-	-
21-Oct-21	EB2308810070	-	SW37	Upstream - Northwestern Corner	Surface Water	Standard	-	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0400	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0200	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	<0.008	<0.008	<0.008	<0.0080	-	-
31-Mar-22	EB2209243019	-	SW37	Upstream - Northwestern Corner	Surface Water	Standard	-	<0.0015	<0.0008	<0.0010	<0.0008	<0.0027	<0.0008	<0.0008	<0.0080	**0.0053**	**0.0046**	<0.0024	<0.0010	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0099**	-	-
06-Jul-22	EB2220051004	-	SW37	Upstream - Northwestern Corner	Surface Water	Standard	-	<0.0032	<0.0032	<0.0032	<0.0032	<0.0064	<0.0032	<0.0032	<0.0159	<0.0083	<0.0055	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.0032	-	-
03-Nov-22	EB2232870013	-	SW37	Upstream - Northwestern Corner	Surface Water	Standard	-	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0080	<0.0045	**0.0027**	**0.0019**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0046**	-	-
19-May-21	EB2114060018	-	SW39	Onsite - Northwestern Dam	Surface Water	Standard	-	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016	-	-
19-Oct-21	EB2308810071	-	SW40	Jambin Dakenba Road	Surface Water	Standard	-	<0.0016	<0.0016	**0.0171**	<0.0016	**0.0155**	<0.0016	**0.0326**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0326**	-	-
26-Oct-21	EB2308810072	-	SW40	Jambin Dakenba Road	Surface Water	Standard	-	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016	-	-
18-Jan-22	EB2202169011	-	SW40	Jambin Dakenba Road	Surface Water	Standard	-	**0.0023**	**0.0024**	**0.029**	**0.0012**	**0.0356**	<0.0008	**0.0446**	<0.0039	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0019	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0705**	-	-
31-Mar-22	EB2209243030	-	SW40	Jambin Dakenba Road	Surface Water	Standard	-	<0.0017	**0.0018**	**0.0227**	**0.0012**	**0.0418**	<0.0007	**0.0645**	<0.0036	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0018	<0.0007	<0.002	<0.002	<0.002	<0.002	<0.0007	<0.0007	<0.001	<0.001	<0.001	<0.001	**0.0675**	-	-
06-Jul-22	EB2220051019	-	SW40	Jambin Dakenba Road	Surface Water	Standard	-	**0.0082**	**0.0025**	**0.0281**	<0.0014	**0.0606**	<0.0005	**0.0887**	<0.0080	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0040	<0.0005	<0.004	<0.004	<0.001	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0994**	-	-
26-Oct-22	EB2232800012	-	SW40	Jambin Dakenba Road	Surface Water	Standard	-	**0.0030**	<0.0008	**0.032**	**0.0014**	**0.0434**	<0.0008	**0.0754**	<0.0040	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0798**	-	-
07-Jun-23	EB2318365049	-	SW40	Jambin Dakenba Road	Surface Water	Standard	-	**0.0036**	**0.0025**	**0.0267**	**0.0013**	**0.0216**	<0.0005	**0.0483**	<0.0078	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0557**	-	-
21-Oct-21	EB2308810073	-	SW41	Callide Wier	Surface Water	Standard	-	<0.0016	<0.0016	<0.0055	<0.0016	<0.0119	<0.0016	<0.0055	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016	-	-
24-Jan-22	EB2202169056	-	SW41	Callide Wier	Surface Water	Standard	-	<0.0210	<0.0016	**0.0042**	<0.0016	**0.0064**	<0.0016	**0.0106**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0116**	-	-
05-Apr-22	EB2209861010	-	SW41	Callide Wier	Surface Water	Standard	-	**0.0016**	<0.0016	**0.0103**	<0.0016	**0.0236**	<0.0016	**0.0339**	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0355**	-	-
07-Jul-22	EB2220051024	-	SW41	Callide Wier	Surface Water	Standard	-	<0.0060	<0.0024	**0.0191**	<0.0010	**0.0242**	<0.0008	**0.0433**	<0.0038	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0443**	-	-
02-Nov-22	EB2232870004	-	SW41	Callide Wier	Surface Water	Standard	-	<0.0100	<0.0025	**0.0207**	<0.0011	**0.0242**	<0.0005	**0.0449**	<0.0020	**0.0046**	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0008	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0495**	-	-
06-Mar-23	EB2306934038	-	SW41	Callide Wier	Surface Water	Standard	-	**0.0047**	<0.0015	**0.0164**	<0.0010	**0.0339**	<0.0005	**0.0503**	<0.0159	<0.0032	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0079	<0.0005	<0.008	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0550**	-	-
12-Jun-23	EB2318365050	-	SW41	Callide Wier	Surface Water	Standard	-	**0.0021**	**0.0022**	**0.023**	**0.0011**	**0.0217**	<0.0005	**0.0447**	<0.0078	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0501**	-	-
08-Dec-23	EB2339753009	-	SW41	Callide Wier	Surface Water	Standard	-	**0.0022**	<0.0015	**0.0109**	<0.0005	**0.0152**	<0.0005	**0.0261**	<0.0080	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0021	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0283**	-	-
19-Oct-21	EB2308810038	-	SW42	Dunn Creek (Downstream of SW17)	Surface Water	Standard	-	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0156	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0078	<0.0031	<0.008	<0.008	<0.008	<0.008	<0.0031	<0.0031	<0.003	<0.003	<0.003	<0.003	<0.0031	-	-
29-Oct-21	EB2130787003	-	SW42	Dunn Creek (Downstream of SW17)	Surface Water	Standard	-	**0.0089**	<0.0020	**0.0116**	<0.0016	**0.0189**	<0.0016	**0.0305**	<0.0080	**0.0049**	<0.0027	**0.0024**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0337**	-	-
12-Nov-21	EB2133062005	CS Energy	SW42	Dunn Creek (Downstream of SW17)	Surface Water	Standard	-	<0.0030	<0.0016	**0.0021**	<0.0016	**0.0045**	<0.0016	**0.0066**	<0.008	<0.0030	**0.0022**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0058**	-	-
02-Dec-21	EB2135860009	CS Energy	SW42	Dunn Creek (Downstream of SW17)	Surface Water	Standard	-	**0.0046**	**0.0042**	**0.0242**	<0.0025	**0.0190**	<0.0008	**0.0422**	**0.0220**	**0.0265**	**0.0138**	**0.0082**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.1230**	-	-
07-Jul-22	EB2220051041	-	SW42	Dunn Creek (Downstream of SW17)	Surface Water	Standard	-	**0.0062**	<0.0033	**0.0164**	<0.0064	<0.0008	<0.0064	**0.0228**	<0.0396	<0.0021	<0.0017	<0.0016	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0199	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0226**	-	-
01-Nov-22	EB2232870002	-	SW42	Dunn Creek (Downstream of SW17)	Surface Water	Standard	-	**0.0104**	<0.0040	**0.0172**	<0.0008	<0.0062	<0.0008	**0.0172**	<0.0040	<0.0030	<0.0025	<0.0025	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0276**	-	-
01-Dec-22	EB2236118004	CS Energy	SW42	Dunn Creek (Downstream of SW17)	Surface Water	Standard	-	**0.0067**	**0.0022**	**0.0136**	<0.0016	**0.0021**	<0.0016	**0.0157**	<0.0080	**0.0018**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0264**	-	-
05-Jan-23	EB2300551008	CS Energy	SW42	Dunn Creek (Downstream of SW17)	Surface Water	Standard	-	**0.0100**	**0.0024**	**0.0118**	<0.0005	**0.0052**	<0.0005	**0.0170**	<0.0070	<0.0060	<0.0030	**0.0044**	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0021	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0244**	-	-
21-Mar-21	EB2107988027	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0025	<0.0008	<0.0040	<0.0008	<0.0024	<0.0008	<0.0008	<0.0040	**0.0031**	**0.0015**	**0.0018**	**0.0018**	<0.0008	**0.0008**	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0090**	-	-
19-May-21	EB2114060024	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0016	<0.0016	**0.0019**	<0.0016	**0.0027**	<0.0016	**0.0046**	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0046**	-	-
07-Jul-21	EB2119293008	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0120	<0.0016	**0.0021**	<0.0016	**0.0040**	<0.0016	**0.0061**	<0.0120	<0.0016	**0.0032**	**0.0035**	**0.0016**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0144**	-	-
21-Oct-21	EB2308810011	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0020	<0.0015	<0.0015	<0.0015	**0.0030**	<0.0015	**0.0030**	<0.0080	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0038	<0.0015	<0.004	<0.004	<0.004	<0.004	<0.0015	<0.0015	<0.002	<0.002	<0.002	<0.002	**0.0030**	-	-
26-Oct-21	EB2130787004	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0020	<0.0016	**0.002**	<0.0016	**0.0028**	<0.0016	**0.0048**	<0.0082	<0.0017	<0.0016	**0.0016**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0041	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0030**	-	-
08-Dec-21	EB2135860019	CS Energy	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0030	<0.0008	<0.0035	<0.0008	**0.0039**	<0.0008	**0.0074**	<0.008	<0.0015	**0.0024**	<0.0020	**0.0019**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0117**	-	-
19-Jan-22	EB2202169019	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0045	<0.0016	**0.0041**	<0.0016	**0.0033**	<0.0016	**0.0074**	<0.0082	<0.0016	**0.0033**	<0.0020	**0.0023**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0041	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0130**	-	-
31-Mar-22	EB2209243024	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0035	<0.0008	**0.0043**	<0.0008	**0.0055**	<0.0008	**0.0098**	<0.0038	<0.0022	**0.0045**	<0.0034	**0.003**	**0.0009**	**0.001**	<0.0008	<0.0008	<0.0008	<0.0188	<0.0008	<0.019	<0.019	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0192**	-	-
07-Jul-22	EB2220051020	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0035	<0.0006	<0.0023	<0.0005	<0.0008	<0.0005	<0.0002	<0.0080	<0.0016	<0.0016	<0.0006	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0040	<0.0005	<0.004	<0.004	<0.001	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0016	-	-
25-Oct-22	EB2232800002	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	**0.0030**	<0.0008	**0.0035**	<0.0008	**0.0026**	<0.0008	**0.0061**	**0.0063**	**0.0012**	**0.0009**	**0.001**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0204**	-	-
01-Dec-22	EB2236118003	CS Energy	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0016	<0.0016	**0.0053**	<0.0016	**0.0035**	<0.0016	**0.0088**	**0.0157**	<0.0016	**0.0026**	**0.0026**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0323**	-	-
05-Jan-23	EB2300551005	CS Energy	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	<0.0025	<0.0008	**0.0023**	<0.0008	**0.0027**	<0.0008	**0.0050**	<0.0120	<0.0025	**0.0017**	**0.0011**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	**0.0078**	-	-
28-Feb-23	EB2306934011	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	Standard	-	**0.0051**	<0.0032	**0.0032**	<0.0032	**0.0064**	<0.0032	**0.0096**	**0.0105**	**0.0169**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0433**	-	-
21-Mar-21	EB2107988028	-	SW44	Callide A Northern Stormwater Pond	Surface Water	Standard	-	**0.0077**	<0.0016	**0.0088**	<0.0016	**0.0144**	<0.0016	**0.0232**	**0.0197**	<0.0325	**0.0034**	<0.0055	**0.0021**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0561**	-	-
21-Oct-21	EB2109622001	CS Energy	SW44	Callide A Northern Stormwater Pond	Surface Water	Standard	-	**0.0028**	<0.0005	<0.0016	<0.0005	<0.0016	<0.0005	**0.0037**	<0.0240	<0.0100	<0.0030	**0.001**	**0.0016**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0054**	-	-
21-Oct-21	EB2130810012	-	SW44	Callide A Northern Stormwater Pond	Surface Water	Standard	-	**0.0034**	<0.0030	**0.0152**	<0.0030	**0.0362**	<0.0030	**0.0514**	<0.0153	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0076	<0.0030	<0.008	<0.008	<0.008	<0.008	<0.0030	<0.0030	<0.003	<0.003	<0.003	<0.003	**0.0396**	-	-
26-Oct-21	EB2130787006	-	SW44	Callide A Northern Stormwater Pond	Surface Water	Standard	-	**0.0053**	<0.0039	**0.0086**	<0.0016	**0.0122**	<0.0016	**0.0208**	<0.0130	<0.0023	<0.0034	<0.0026	**0.0022**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.0020**	<0.002	<0.002	**0.0303**	-	-
01-Nov-22	EB2232870001	-	SW44	Callide A Northern Stormwater Pond	Surface Water	Standard	-	<0.0120	<0.0050	<0.0054	<0.0030	**0.0313**	<0.0008	**0.0367**	<0.0040	<0.0008	<0.0008	<0.0008	<0

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T2: Groundwater and Surface Water Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Company	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (µg/L)	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)							Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)										Perfluoroalkyl Sulfonamides (µg/L)							Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)		
								PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)							-	-	-	-	-	**0.0002**	-	-	-	-	-	-	**19**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)							-	-	-	-	-	**0.1300**	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water							-	-	-	-	-	-	-	**0.0700**	-	-	-	-	**0.56**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water							-	-	-	-	-	-	-	**2.0000**	-	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L)) - Standard Analysis							20-500	0.001	0.001	0.001	0.001	0.0001	0.001	0.0010	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005	-	-
Laboratory Level of Reporting (µg/L)) - TOPA							-	0.002	0.002	0.002	0.002	0.0020	0.002	0.0020	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.005	0.002	0.005	0.005	0.001	0.005	0.002	0.002
08-Jun-23	EB2318365041	-	NOTCH-V2	Western Seepage Trench V-notch wier 2	Surface Water	Standard	-	**0.0144**	<0.0080	**0.0371**	<0.0032	**0.0160**	<0.0032	**0.0531**	<0.160	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0675**	-	-
05-Dec-23	EB2339753003	-	NOTCH-V2	Western Seepage Trench V-notch wier 2	Surface Water	Standard	-	**0.0217**	**0.0074**	**0.0578**	<0.0016	**0.0426**	<0.0005	**0.1000**	<0.0080	<0.0016	<0.0016	<0.0005	<0.0035	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0080	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.1300**	-	-
26-Feb-21	EB2105661019	-	CALLIDE-SW01	Standing water beneath Linkes Road bridge	Surface Water	Standard	-	**0.0051**	**0.0058**	**0.081**	<0.0032	**0.0883**	<0.0032	**0.1690**	<0.0200	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.1800**	-	-
26-Feb-21	EB2105661020	-	CALLIDE-SW02	Callide Creek south of Linkes Road bridge	Surface Water	Standard	-	**0.0040**	**0.0018**	**0.0168**	<0.0005	**0.0140**	<0.0005	**0.0308**	<0.0020	<0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0366**	-	-
02-Mar-21	EB2106063007	-	CALLIDE-SW03	Callide Creek downstream of Muirs Road	Surface Water	Standard	-	**0.0051**	<0.0016	<0.0016	<0.0016	**0.0115**	<0.0016	**0.0115**	<0.0360	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0166**	-	-
23-Mar-21	EB2107988029	-	DRD Fill Point	Water Truck fill point at DRD	Surface Water	Standard	-	**0.0045**	**0.0034**	**0.0165**	<0.0016	**0.0148**	<0.0016	**0.0313**	<0.0200	<0.0016	**0.0058**	**0.0024**	**0.0016**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0490**	-	-
23-Mar-21	EB2107988030	-	Evap Point Fill Point	Water supply line (blowdown water to evaporation pond fill point)	Surface Water	Standard	-	**0.0081**	<0.0021	**0.016**	<0.0016	**0.0096**	<0.0016	**0.0256**	<0.240	<0.0750	<0.0040	<0.0065	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0337**	-	-
27-Aug-21	EB2124278002	-	EDD	Eastern Dirty Drain	Surface Water	Standard	-	**0.0054**	<0.0032	**0.0166**	<0.0032	**0.0227**	<0.0032	**0.0393**	<0.0200	<0.0032	**0.0048**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0495**	-	-
09-Sep-21	EB2125964001	-	ADB-SW01	Ash Dam B	Surface Water	TOPA	<20	**0.0130**	**0.007**	**0.034**	<0.002	**0.0180**	<0.002	**0.0520**	**0.0200**	**0.011**	**0.0150**	**0.004**	**0.003**	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	**0.1250**	**0.1250**	**0.078**
15-Sep-22	EB2227507001	-	KROOMBIT-DS	Kroombit Dam	Surface Water	Standard	-	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0159	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.0032	-	-
02-Jun-23	EB2316811034	-	Coal Hopper	Callide A Coal Hopper	Water	Standard	-	<0.0007	<0.0005	<0.0005	<0.0005	**0.0010**	<0.0005	**0.0010**	**0.0311**	<0.0016	<0.0016	<0.0009	**0.001**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0331**	-	-

NOTES:

1	Analyte exceeds the PFAS NEMP Freshwater 99% Species Protection
1	Analyte exceeds the PFAS NEMP Freshwater 95% Species Protection
1	Analyte exceeds the PFAS NEMP Health Based - Drinking Water
1	Analyte exceeds the PFAS NEMP Health Based - Recreational Water
ESCA / ESCP	Eastern Seepage Collection Area / Eastern Seepage Collection Pond
SSCA	Southern Seepage Collection Area
WSCA / WSCP	Western Seepage Collection Area / Western Seepage Collection Pond
DRD	Drains Reclaim Dam

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table 73: Groundwater and Surface Water Analytical Results - Physico-Chemical, Cations & Anions

Sample Date	Laboratory Sample Number	Company	Sample Number	Location	Material Type	Physico-Chemical Parameters				Total Metals (mg/L)		Nutrients (mg/L)					Cations and Anions (mg/L)										
						pH	Specific Conductance (µS/cm)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Manganese	Iron	Ammonia as N	Nitrite as N	Nitrate as N	Nitrite + Nitrate as N	Reactive P	Chloride	Sulfate as SO_4	Hydroxide Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Calcium	Magnesium	Sodium	Potassium	Fluoride	Total Anions (meq/L)	Total Cations (meq/L)	Ionic Balance (%)
Australian Drinking Water Guidelines - Aesthetic						6.5-8.5	-	600	-	0.1	0.3	-	-	-	-	-	250	-	-	-	-	-	-	-	-	-	-	-	-
Australian Drinking Water Guidelines - Health						-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	-	-	-
Laboratory Level of Reporting						0.01	1	10	1	0.001	0.05	0.01	0.01	0.01	0.01	0.01	1	1	1	1	1	1	1	1	1	0.1	0.01	0.01	0.01
Groundwater																													
03-Nov-20	EB2029263069	-	MW01	Onsite - North-western Boundary (Upgradient)	Groundwater	7.79	22,900	**17,500**	-	-	-	-	-	-	-	-	**8,730**	610	<1	<1	650	650	498	837	3,720	28	<0.1	272	256	2.97
07-Apr-20	EB2209861001	-	MW01	Onsite - North-western Boundary (Upgradient)	Groundwater	7.15	23,700	**16,700**	56	**1.190**	**2.83**	0.13	<0.01	0.09	0.09	<0.01	**8,780**	576	<1	<1	729	729	402	753	3,620	15	<0.1	274	240	6.68
04-Nov-22	EB2232870001	-	MW01	Onsite - North-western Boundary (Upgradient)	Groundwater	7.14	26,800	**16,400**	2	**1.700**	**0.93**	0.13	<0.01	<0.01	<0.01	<0.01	**8,920**	591	<1	<1	720	720	505	880	3,930	15	<0.1	278	269	1.71
02-Mar-23	EB2306934016	-	MW01	Onsite - North-western Boundary (Upgradient)	Groundwater	7.59	23,800	**20,700**	7	**2.670**	**1.20**	0.11	<0.01	<0.01	<0.01	<0.01	**8,630**	551	<1	<1	629	629	513	1,130	4,320	28	<0.1	250	307	10.2
14-Jun-23	EB2318365008	-	MW06	Onsite - Western Boundary	Groundwater	7.2	22,700	**16,100**	32	0.038	**0.41**	0.04	<0.01	0.05	0.05	<0.01	**6,630**	2,480	<1	<1	447	447	820	1,060	2,830	1	0.2	248	251	0.74
03-Nov-20	EB2029263031	-	MW09	Onsite - SSCA	Groundwater	7.79	11,400	**5,590**	-	-	-	-	-	-	-	-	**3,390**	1,680	<1	<1	497	497	275	489	1,840	2	0.8	140	134	2.36
20-Jan-21	EB2101853012	-	MW09	Onsite - SSCA	Groundwater	7.58	12,100	**9,110**	-	-	**1.00**	-	-	-	-	-	**3,500**	1,690	<1	<1	445	445	266	510	1,880	<1	0.8	143	137	2.07
20-Oct-21	EB2130810035	-	MW09	Onsite - SSCA	Groundwater	7.83	12,700	**10,400**	154	**0.354**	**0.70**	0.01	<0.01	0.02	0.02	0.07	**3,600**	1,790	<1	<1	483	483	263	572	1,990	<1	0.9	148	147	0.58
06-Apr-22	EB2202169044	-	MW09	Onsite - SSCA	Groundwater	7.68	13,300	**10,200**	1,180	**0.290**	**2.52**	0.03	<0.01	0.02	0.02	0.08	**3,900**	1,860	<1	<1	533	533	281	606	2,030	2	0.8	159	152	2.29
03-Apr-22	EB2209243051	-	MW09	Onsite - SSCA	Groundwater	7.63	12,500	**9,030**	306	**0.354**	**4.63**	<0.01	<0.01	0.31	0.31	0.04	**3,410**	1,800	<1	<1	525	525	273	544	1,860	<1	0.8	144	139	1.71
09-Jul-22	EB2220051036	-	MW09	Onsite - SSCA	Groundwater	7.88	12,100	**11,600**	6	**0.250**	0.08	<0.01	0.01	3.86	3.87	0.05	**4,430**	2,160	<1	<1	480	480	356	738	2,230	1	0.7	180	176	1.12
03-Nov-22	EB2232870001	-	MW09	Onsite - SSCA	Groundwater	7.35	16,700	**10,600**	17	**0.284**	**0.37**	<0.01	<0.01	1.72	1.72	0.05	**4,470**	2,150	<1	<1	577	577	331	640	1,970	<1	0.8	182	155	8.15
03-Mar-23	EB2306934030	-	MW09	Onsite - SSCA	Groundwater	7.93	12,500	**9,560**	99	**0.390**	**1.41**	0.03	<0.01	0.15	0.15	0.03	**3,280**	1,720	<1	<1	462	462	252	316	633	1,790	2	0.7	137	146	2.97
06-Jun-23	EB2318365009	-	MW09	Onsite - SSCA	Groundwater	7.56	12,500	**8,570**	49	**0.313**	**1.02**	0.06	<0.01	<0.01	<0.01	0.05	**3,040**	1,690	<1	<1	472	472	309	520	1,710	<1	0.8	130	132	0.85
06-Sep-23	EB2328001007	-	MW09	Onsite - SSCA	Groundwater	7.62	12,600	**9,270**	426	**0.422**	**2.34**	0.02	<0.01	0.34	0.34	0.03	**3,370**	1,890	<1	<1	458	458	324	634	1,920	1	0.8	144	152	2.82
06-Dec-23	EB2339753017	-	MW09	Onsite - SSCA	Groundwater	7.8	12,300	**8,620**	198	**0.424**	**3.68**	<0.01	<0.01	<0.01	<0.01	0.03	**3,120**	1,760	<1	<1	453	453	221	516	1,750	<1	0.8	134	130	1.55
01-Apr-22	EB2209243038	-	MW11	Onsite - Adjacent to ESCA	Groundwater	7.55	8,020	**6,880**	2	**1.470**	0.18	0.03	<0.01	<0.01	<0.01	<0.01	**2,170**	1,750	<1	<1	269	269	429	422	968	<1	0.6	103	98.2	2.37
09-Jul-22	EB2220051035	-	MW11	Onsite - Adjacent to ESCA	Groundwater	7.9	7,360	**6,910**	3	**1.580**	0.14	0.01	<0.01	<0.01	<0.01	<0.01	**1,960**	1,670	<1	<1	216	216	409	405	966	<1	0.5	94.4	95.8	0.73
28-Oct-22	EB2232600028	-	MW11	Onsite - Adjacent to ESCA	Groundwater	7.74	9,160	**7,330**	6	**1.870**	0.10	0.03	<0.01	<0.01	<0.01	<0.01	**2,400**	1,840	<1	<1	224	224	509	515	1,060	<1	0.5	110	114	1.52
02-Mar-23	EB2306934019	-	MW11	Onsite - Adjacent to ESCA	Groundwater	7.87	9,630	**8,460**	3	**2.000**	**2.62**	0.03	<0.01	<0.01	<0.01	<0.01	**2,370**	1,740	<1	<1	227	227	564	545	973	<1	0.5	108	115	3.46
06-Jun-23	EB2318365010	-	MW11	Onsite - Adjacent to ESCA	Groundwater	7.5	9,980	**7,400**	<1	**1.940**	0.09	0.04	<0.01	<0.01	<0.01	<0.01	**2,360**	1,750	<1	<1	218	218	540	487	993	<1	0.6	107	110	1.31
06-Mar-23	EB2306934035	-	MW23	Onsite - SSCA	Groundwater	7.93	8,940	**8,250**	1	**0.904**	<0.05	0.05	<0.01	<0.01	<0.01	<0.01	**2,240**	1,630	<1	<1	196	196	499	509	788	1	0.8	101	101	0.03
14-Jun-23	EB2318365011	-	MW26	Onsite - Western Boundary	Groundwater	7.48	10,200	**6,500**	1	**0.154**	0.08	0.25	0.03	0.77	0.80	0.38	**2,770**	776	<1	<1	477	477	293	373	1,320	1	0.3	104	103	0.51
21-Jan-21	EB2101853017	-	MW27	Onsite - Western Boundary	Groundwater	7.56	19,700	**14,800**	-	-	**3.72**	-	-	-	-	-	**6,670**	1,000	<1	<1	834	834	202	688	3,240	3	0.8	226	208	4.14
14-Jun-23	EB2318365012	-	MW27	Onsite - Western Boundary	Groundwater	7.4	22,800	**14,700**	10	**0.370**	0.11	<0.01	<0.01	<0.01	<0.01	0.04	**6,980**	1,020	<1	<1	902	902	270	834	3,530	3	0.8	236	236	0.09
01-Apr-22	EB2209243037	-	MW30	Onsite - Adjacent to ESCA	Groundwater	7.38	2,060	**2,470**	4	**0.201**	0.29	0.07	<0.01	<0.01	<0.01	<0.01	**684**	478	<1	<1	405	405	376	118	142	<1	0.1	37.3	34.6	3.73
28-Oct-22	EB2232600029	-	MW30	Onsite - Adjacent to ESCA	Groundwater	7.6	2,820	**2,280**	10	**0.266**	**0.43**	0.07	<0.01	0.02	0.02	<0.01	**572**	421	<1	<1	346	346	347	111	142	<1	0.1	31.8	32.6	1.26
28-Feb-20	EB2105661034	-	MW31	Onsite - Adjacent to ESCA	Groundwater	7.49	8,970	**6,800**	-	-	-	-	-	-	-	0.02	**2,430**	1,450	<1	<1	343	343	278	464	1,170	1	0.9	106	103	1.25
23-Oct-21	EB2130810018	-	MW31	Offsite - Adjacent to ESCA	Groundwater	7.89	5,060	**3,580**	11	**2.410**	**0.36**	0.20	<0.01	0.01	0.01	0.04	**1,440**	21	<1	<1	574	574	116	286	543	<1	0.8	52.5	52.9	0.4
20-Jan-22	EB2202169039	-	MW31	Offsite - Adjacent to ESCA	Groundwater	7.71	5,740	**3,970**	20	**0.497**	0.29	<0.01	<0.01	0.10	0.10	0.03	**1,610**	22	<1	<1	631	631	149	327	588	1	0.8	58.5	60	1.24
01-Apr-22	EB2209243035	-	MW31	Offsite - Adjacent to ESCA	Groundwater	7.86	3,030	**2,620**	1	0.071	<0.05	<0.01	<0.01	0.13	0.13	0.03	**1,090**	19	<1	<1	678	678	90	219	489	<1	0.8	44.7	43.8	1.02
08-Jul-22	EB2220051031	-	MW31	Offsite - Adjacent to ESCA	Groundwater	8.15	2,520	**1,450**	8	0.061	<0.05	<0.01	<0.01	0.48	0.48	<0.01	**816**	17	<1	<1	537	537	49	119	368	<1	0.8	28.4	28.2	0.38
28-Oct-22	EB2232600027	-	MW31	Offsite - Adjacent to ESCA	Groundwater	7.95	3,890	**2,400**	<5	**0.190**	<0.05	<0.01	<0.01	0.21	0.21	0.03	**1,000**	16	<1	<1	495	495	85	210	487	<1	0.8	38.4	42.7	5.27
04-Mar-23	EB2306934033	-	MW31	Offsite - Adjacent to ESCA	Groundwater	8.29	2,120	**1,200**	<1	0.053	<0.05	<0.01	<0.01	0.18	0.18	0.03	**422**	13	<1	2	507	510	38	94	272	<1	1	22.4	21.5	2.05
09-Jun-23	EB2318365013	-	MW31	Offsite - Adjacent to ESCA	Groundwater	7.65	3,430	**2,040**	2	**0.382**	0.16	0.03	<0.01	0.01	0.01	0.04	**867**	13	<1	<1	550	550	76	172	410	<1	0.9	35.7	35.8	0.09
08-Dec-23	EB2339753018	-	MW31	Offsite - Adjacent to ESCA	Groundwater	7.87	5,290	**3,760**	3	**0.232**	0.07	0.01	<0.01	0.06	0.06	0.04	**1,320**	21	<1	<1	574	574	59	284	510	<1	0.8	49.1	48.5	0.65
28-Feb-20	EB2105661038	-	MW32	Offsite - Adjacent to ESCA	Groundwater	7.61	5,780	**3,750**	75	**0.349**	**0.59**	<0.01	<0.01	0.14	0.14	0.04	**1,770**	23	<1	<1	584	584	142	343	599	<1	0.7	60.1	61.4	1.04
23-Oct-21	EB2130810019	-	MW32	Offsite - Adjacent to ESCA	Groundwater	7.34	5,950	**5,380**	56	**0.269**	**1.30**	0.04	<0.01	0.04	0.04	<0.01	**1,470**	790	<1	<1	474	474	404	440	271	<1	0.6	67.4	68.2	0.57
20-Jan-22	EB2202169040	-	MW32	Offsite - Adjacent to ESCA	Groundwater	7.27	6,870	**5,230**	456	**0.752**	**6.09**	<0.01	<0.01	<0.01	<0.01	<0.01	**1,820**	826	<1	<1	504	504	458	484	291	<1	0.6	73	73.5	1.6
30-Mar-22	EB2209243016	-	MW32	Offsite - Adjacent to ESCA	Groundwater	7.04	3,130	**4,650**	15	**0.700**	**0.80**	<0.01	<0.01	<0.01	<0.01	<0.01	**1,640**	928	<1	<1	532	532	473	475	289	<1	0.6	76.2	75.3	0.62
08-Jul-22	EB2220051030	-	MW32	Offsite - Adjacent to ESCA	Groundwater	7.64	5,650	**4,630**	26	**0.761**	**2.10**	0.02	<0.01	<0.01	<0.01	0.04	**1,640**	924	<1	<1	459	459	419	464	285	<1	0.5	74.7	71.5	2.17
31-Oct-22	EB2232600035	-	MW32	Offsite - Adjacent to ESCA	Groundwater	7.14	7,110	**4,780**	26	**0.824**	**2.72**	0.02	<0.01	<0.01	<0.01	<0.01	**1,690**	970	<1	<1	512	512	505	555	319	<1	0.6	78.1	84.8	4.09
04-Mar-23	EB2306934034	-	MW32	Offsite - Adjacent to ESCA	Groundwater	7.7	6,760	**5,950**	3	**0.899**	0.16	0.03	<0.01	<0.01	<0.01	<0.01	**1,700**	889	<1	<1	443	443	490	513	255	<1	0.6	75.3	77.8	1.6
10-Jun-23	EB2318365014	-	MW32	Offsite - Adjacent to ESCA	Groundwater	7	7,010	**4,060**	<1	**0.750**	0.25	0.06	<0.01	<0.01	<0.01	<0.01	**1,660**	950	<1	<1	474	474	505	510	287	<1	0.6	76.1	79.6	2.3
07-Sep-23	EB2328001008	-	MW32	Offsite - Adjacent to ESCA	Groundwater	7.88	7,060	**5,000**	<5	**0.826**	0.15	0.03	<0.01	<0.01	<0.01	<0.01	**1,590**	966	<1	<1	399	399	402	436	242	<1	0.6	72.9	66.5	4.64
08-Dec-23	EB2339753019	-	MW32	Offsite - Adjacent to ESCA	Groundwater	7.43	6,900	**6,740**	<1	**0.776**	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	**1,640**	972	<1	<1	465	465	455	445	506	291	<1	0.6	75.8	76.5	0.47
28-Feb-21	EB2105661039	-	MW33	Offsite - Adjacent to ESCA	Groundwater	7.14	5,540	**4,060**	106	**0.618**	**5.57**	0.02	<0.01	0.03	0.03	<0.01	**1,400**	746	<1	<1	515	515	376	421	274	<1	0.6	65.3	65.3	0.01
12-Dec-23	EB2339753020	-	MW33	Offsite - Adjacent to ESCA	Groundwater	7.54	5,390	**5,300**	5	**2.010**	0.36	0.64	<0.01	0.01	0.01	<0.01	**1,520**	56	<1	<1	136	136	351	42	584	2	0.4	46.8	46.4	0.36
20-Feb-21	EB2104890017	-	MW34	Onsite - WSCA	Groundwater	7.3	8,540	**6,460**	770	**0.872**	**28.60**	<0.01	<0.01	0.04	0.04	0.04	**2,480**	656	<1	<1	675	675	214	477	974	<1	0.6	97.1	92.3	2.53
20-Oct-21	EB2130810020	-	MW34	Onsite - WSCA	Groundwater	7.65	8,340	**6,480**	929	**0.756**	**16.50**	0.02	<0.01	0.04	0.04	0.03	**2,440**	649	<1	<1	650	650	208	475	984	<1	0.6	95.3	92.3	1.63
21-Jan-22	EB2202169049	-	MW34	Onsite - WSCA	Groundwater	7.72	8,830	**6,540**	810	**0.890**	**14.10**	0.03	<0.01	0.06	0.06	0.10	**2,670**	619	<1	<1	708	708	227	489	1,010	1	0.6	102	95.5	3.44
02-Apr-22	EB2209243044	-	MW40	Onsite - WSCA	Groundwater	7.5	7,830	**6,030**	11	**0.563**	**0.40**	<0.01	<0.01	0.02	0.02	0.02	**2,380**	657	<1	<1	737	737	214	474	979	<1	0.6	95.5	92.3	1.74
14-Jul-22	EB2220736015	-	MW40	Onsite - WSCA	Groundwater	7.28	8,520	**6,540**	32	**0.548**	**1.24**	<0.01	<0.01	0.06	0.06	0.03	**2,470**	690	<1	<1	687	687	208	465	1,030	<1	0.6	97.8	93.4	2.26
27-Oct-22	EB2232600020	-	MW40	Onsite - WSCA	Groundwater	7.68	8,320	**6,150**	50	**0.537**	0.18	0.06	<0.01	<0.01	<0.01	<0.01	**2,450**	660	<1	<1	637	637	221	493	995	<1	0.6	95.6	94.9	0.36
01-Mar-23	EB2306934015	-	MW40	Onsite - WSCA	Groundwater	7.85	8,750	**7,110**	85	**0.587**	**1.53**	0.03	0.01	0.05	0.06	0.02	**2,400**	638	<1	<1	630	630	208	515	912	1	0.4	93.6	92.5	0.6
12-Jun-23	EB2318365015	-	MW40	Onsite - WSCA	Groundwater	7.35	8,990	**6,040**	55	**0.539**	0.20	0.05	<0.01	0.10	0.10	0.04	**2,380**	676	<1	<1	673	673	238	482	980	<1	0.6	94.6	94.2	0.26
06-Sep-23	EB2328001009	-	MW40	Onsite - WSCA	Groundwater	8.26	8,970	**6,630**	8	**0.555**	<0.05	0.08	0.03	0.02	0.05	0.04	**2,550**	723	<1	<1	621	621	226	505	1,030	<1	0.6	99.4	97.6	0.89
06-Dec-23	EB2339753021	-	MW40	Onsite - WSCA	Groundwater	7.72	8,670	**6,760**	38	**0.550**	**1.82**	<0.01	<0.01	0.09	0.09	0.03	**2,420**	677	<1	<1	659	659	148	490	965	<1	0.6	95.5	89.7	3.15
03-Nov-20	EB2029263068	-	MW41	Onsite - WSCA	Groundwater	7.56	11,300	**8,810**	-	-	-	-	-	-	-	-	**4,060**	954	<1	<1	483	483	694	649	934	2	0.4	144	129	5.62
21-Jan-21	EB2101853016	-	MW41	Onsite - WSCA	Groundwater	7.34	12,100	**9,170**	-	-	**2.78**	-	-	-	-	-	**4,090**	907	<1	<1	437	437	622	657	902	1	0.4	143	124	6.96
28-Feb-13	EB2105661033	-	MW42	Onsite - SSCA	Groundwater	7.3	1,820	**1,380**	-	-	-	-	-	-	-	0.02	**473**	47	<1	<1	258	258	258	130	71	133	2	0.1	19.4	18.2	3.4
12-Jun-23	EB2318365016	-	MW42	Onsite - SSCA	Groundwater	7.44	10,600	**7,330**	2	**3.770**	<0.05	<0.01	<0.01	<0.01	<0.01	0.01	**2,650**	1,510	<1	<1	332	332	294	444	1,370	1	1.4	113	111	0.89
06-Sep-23	EB2328001010	-	MW42	Onsite - SSCA	Groundwater	8.19	10,800	**8,010**	<5	**4.170**	0.17	0.02	<0.01	<0.01	<0.01	0.02	**2,550**	1,630	<1	<1	322	322	305	490	1,500	2	1.4	119	121	0.61
07-Dec-23	EB2339753022	-	MW42	Onsite - SSCA	Groundwater	7.82	11,300	**8,420**	3	**4.360**	0.12	0.03	<0.01	<0.01	<0.01	0.02	**2,910**	1,580	<1	<1	337	337	274	499	1,480	1	1.5	122	119	1.07
20-Jan-21	EB2101853009	-	MW43	Offsite - Adjacent to ESCA	Groundwater	7.46	5,600	**4,710**	-	-	**1.43**	-	-	-	-	-	**1,360**	842	<1	<1	497	497	280	449	358	2	0.4	65.8	66.5	0.55
23-Oct-21	EB2130810021	-	MW43	Offsite - Adjacent to ESCA	Groundwater	7.7	5,100	**4,230**	32	**0.103**	**0.58**	<0.01	<0.01	0.03	0.03	<0.01	**1,190**	773	<1	<1	499	499	257	446	365	2	0.4	59.6	65.4	4.66
20-Jan-22	EB2202169037	-	MW43	Offsite - Adjacent to ESCA	Groundwater	7.54	6,470	**5,180**	114	**0.208**	**1.37**	0.01	<0.01	<0.01	<0.01	<0.01	**1,440**	959	<1	<1	475	475	303	493	382	2	0.4	70.1	72.4	1.6
03-Apr-22	EB2209243052	-	MW43	Offsite - Adjacent to ESCA	Groundwater	7.52	4,080	**4,830**	1	0.030	0.05	<0.01	<0.01	0.55	0.55	<0.01	**1,380**	1,060	<1	<1	506	506	272	489	374	<1	<1.0	71.1	70.1	0.72
10-Jul-22	EB2220051037	-	MW43	Offsite - Adjacent to ESCA	Groundwater	7.85	5,320	**4,650**	6	0.098	0.16	0.02	<0.01	<0.01	<0.01	<0.01	**1,400**	970	<1	<1	432	432	269	473	378	<1	0.4	68.3	68.8	0.35
06-Sep-23	EB2328000032	-	MW43	Offsite - Adjacent to ESCA	Groundwater	7.98	6,800	**4,890**	20	**0.157**	**0.60**	<0.01	<0.01	<0.01	<0.01	<0.01	**1,370**	964	<1	<1	526	526	298	533	408	1	0.5	69.2	76.5	5
03-Mar-23	EB2306934024	-	MW43	Offsite - Adjacent to ESCA	Groundwater	7.74	7,700	**7,760**	28	**0.181**	**0.81**	0.03	<0.01	<0.01	<0.01	<0.01	**1,770**	1,230	<1	<1	457	457	410	689	386	2	0.4	84.7	94	5.23
09-Jun-23	EB2318365017	-	MW43	Offsite - Adjacent to ESCA	Groundwater	7.19	7,630	**5,900**	26	**0.155**	**1.03**	0.06	<0.01	<0.01	<0.01	<0.01	**1,760**	1,180	<1	<1	502	502	398	649	398	1	0.4	84.2	90.6	3.64
07-Sep-23	EB2328001011	-	MW43	Offsite - Adjacent to ESCA	Groundwater	7.98	7,640	**6,740**	<5	**0.114**	**0.57**	0.40	<0.01	<0.01	<0.01	<0.01	**1,700**	1,250	<1	<1	404	404	306	542	345	<1	0.4	82	74.9	4.57
08-Dec-23	EB2339753023	-	MW43	Offsite - Adjacent to ESCA	Groundwater	7.77	7,890	**7,840**	10	**0.153**	**0.72**	0.02	<0.01	<0.01	<0.01	<0.01	**1,740**	1,190	<1	<1	476	476	288	634	402	1	0.4	83.4	84.1	0.41
28-Mar-21	EB2106063004	-	MW45	Evaporation Ponds	Groundwater	7.52	10,600	**7,920**	40	**0.355**	**1.12**	0.03	0.02	0.51	0.53	<0.01	**2,110**	1,330	<1	<1	480	480	321	671	1,080	<1	0.2	127	118	3.68
03-Nov-20	EB2029263030	-	MW46	Onsite - WSCA	Groundwater	7.66	17,400	**13,400**	-	-	-	-	-	-	-	-	**6,400**	936	<1	<1	733	733	521	753	2,480	8	0.4	215	196	4.53
21-Jan-21	EB2101853015	-	MW46	Onsite - WSCA	Groundwater	7.47	18,100	**13,900**	-	-	**2.57**	-	-	-	-	-	**6,510**	888	<1	<1	652	652	488	796	2,220	8	0.4	211	200	2.78
17-Apr-21	EB2106898032	-	MW48	Onsite - WSCA	Groundwater	7.88	18,300	**12,700**	47	**2.670**	**1.41**	0.07	<0.01	0.01	0.01	<0.01	**6,600**	1,010	<1	<1	729	729	592	874	2,530	4	0.5	222	212	2.34
29-Jul-21	EB2130810022	-	MW48	Onsite - WSCA	Groundwater	7.66	17,900	**14,900**	63	**2.550**	**1.26**	0.05	<0.01	<0.01	<0.01	<0.01	**6,110**	916	<1	<1	695	695	482	783	2,490	4	0.5	205	197	2.09
20-Jan-22	EB2202169043	-	MW48	Onsite - WSCA	Groundwater	7.54	18,800	**14,300**	47	**2.760**	**0.99**	<0.01	<0.01	<0.01	<0.01	<0.01	**6,430**	968	<1	<1	749	749	609	855	2,490	4	0.4	216	209	1.72
02-Apr-22	EB2209243045	-	MW48	Onsite - WSCA	Groundwater	7.38	17,500	**14,000**	54	**2.730**	**1.99**	0.05	<0.01	<0.01	<0.01	<0.01	**6,090**	1,000	<1	<1	783	783	540	822	2,460	4	0.4	208	202	1.6
13-Jul-22	EB2220736010	-	MW48	Onsite - WSCA	Groundwater	7.02	15,500	**12,400**	10	**2.600**	**2.09**	0.10	<0.01	<0.01	<0.01	<0.01	**5,300**	900	<1	<1	682	682	457	649	2,110	4	0.5	182	168	3.93
27-Oct-22	EB2232600019	-	MW49	Onsite - WSCA	Groundwater	7.53	18,000	**13,400**	72	**3.080**	**2.30**	0.11	<0.01	<0.01	<0.01	<0.01	**5,730**	1,070	<1	<1	693	693	606	838	2,420	4	0.4	198	204	1.69
03-Mar-23	EB2306934031	-	MW49	Onsite - WSCA	Groundwater	7.78	17,300	**15,500**	22	**2.800**	**2.79**	0.08	<0.01	<0.01	<0.01	<0.01	**5,540**	1,020	<1	<1	695	695	596	854	2,250	4	0.4	191	198	1.72
13-Jun-23	EB2318365018	-	MW49	Onsite - WSCA	Groundwater	7.22	16,000	**10,800**	6	**2.510**	**2.72**	0.05	<0.01	<0.01	<0.01	<0.01	**4,960**	897	<1	<1	690	690	491	645	2,060	4	0.5	172	167	1.5
06-Sep-23	EB2328001012	-	MW49	Onsite - WSCA	Groundwater	7.79	14,800	**11,500**	19	**2.190**	**2.64**	0.03	<0.01	0.02	0.02	<0.01	**4,680**	836	<1	<1	497	497	437	618	2,030	3	0.3	159	161	0.53
06-Dec-23	EB2339753024	-	MW49	Onsite - WSCA	Groundwater	7.74	13,000	**9,400**	<1	0.008	<0.05	0.02	<0.01	0.07	0.07	0.04	**4,050**	772	<1	<1	651	651	129	387	2,200	<1	1	143	134	3.37
20-Feb-21	EB2104890012	-	MW56	Onsite - WSCA	Groundwater	7.56	10,600	**7,540**	<1	0.004

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20-Jan-22	EB2202169003	-	L012-B01	Downstream (5.3km)	Groundwater	6.75	1,640	**1,500**	<1	0.007	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	**493**	48	<1	<1	171	171	144	61	114	2	0.1	18.3	17.2	3.11
06-Apr-22	EB2206861014	-	L012-B01	Downstream (5.3km)	Groundwater	7.06	1,260	**1,270**	<1	0.011	<0.05	<0.01	<0.01	<0.01	0.01	**455**	57	<1	<1	191	191	118	58	113	2	0.1	17.8	15.6	6.6
12-Jul-22	EB2220736001	-	L012-B01	Downstream (5.3km)	Groundwater	7.1	1,500	**1,230**	<1	0.010	<0.05	<0.01	<0.01	0.01	0.01	**380**	68	<1	<1	173	173	-	-	-	-	<0.1	-	-	-
03-Nov-22	EB2232870001	-	L012-B01	Downstream (5.3km)	Groundwater	7.03	1,470	**979**	<1	0.011	<0.05	<0.01	<0.01	<0.01	<0.01	**346**	94	<1	<1	186	186	100	48	98	2	0.1	15.5	13.2	7.78
08-Mar-23	EB2306934047	-	L012-B01	Downstream (5.3km)	Groundwater	7.71	1,360	**1,020**	<1	0.008	<0.05	0.03	<0.01	<0.01	0.01	**304**	87	<1	<1	161	161	98	51	103	2	0.1	13.6	13.6	0.06
14-Jun-23	EB2318365006	-	L012-B01	Downstream (5.3km)	Groundwater	7.18	1,360	**972**	<1	0.008	<0.05	0.02	<0.01	<0.01	0.01	**302**	85	<1	<1	172	172	101	50	100	2	0.1	13.7	13.6	0.62
08-Sep-23	EB2328001005	-	L012-B01	Downstream (5.3km)	Groundwater	7.22	1,330	**1,020**	<5	0.009	<0.05	0.16	<0.01	<0.01	<0.01	**290**	84	<1	<1	168	168	99	50	102	2	0.2	13.3	13.5	0.96
11-Dec-23	EB2339753015	-	L012-B01	Downstream (5.3km)	Groundwater	7.54	1,380	**1,050**	<1	0.009	<0.05	<0.01	<0.01	<0.01	<0.01	**299**	86	<1	<1	179	179	94	52	101	2	0.1	13.8	13.4	1.42
25-Feb-21	EB2105661002	-	L021-G01	Downstream (4.5km)	Groundwater	7.51	412	261	<1	<0.001	<0.05	<0.01	<0.01	0.08	0.08	0.02	47	12	<1	<1	130	130	26	12	50	<1	0.2	4.17	4.46	3.32
22-Oct-21	EB2130810017	-	L021-G01	Downstream (4.5km)	Groundwater	7.75	420	256	30	<0.001	<0.05	<0.01	<0.01	0.09	0.09	0.01	49	11	<1	<1	127	127	24	12	50	<1	0.2	4.15	4.36	2.48
20-Jan-22	EB2202169001	-	L021-G01	Downstream (4.5km)	Groundwater	6.95	404	268	<1	<0.001	<0.05	<0.05	<0.01	0.08	0.08	0.01	51	10	<1	<1	134	134	24	11	50	<1	0.1	4.32	4.28	0.54
05-Apr-22	EB2209861012	-	L021-G01	Downstream (4.5km)	Groundwater	7.22	419	242	<1	<0.001	<0.05	<0.01	<0.01	0.06	0.06	0.01	51	8	<1	<1	151	151	25	12	52	<1	0.2	4.62	4.5	1.37
12-Jul-22	EB2220736002	-	L021-G01	Downstream (4.5km)	Groundwater	7.42	428	279	<1	<0.001	<0.05	<0.01	<0.01	0.12	0.12	0.01	50	9	<1	<1	133	133	25	13	53	1	0.1	4.26	4.65	4.42
03-Nov-22	EB2232870001	-	L021-B01	Downstream (4.5km)	Groundwater	7.45	470	261	<1	0.002	<0.05	<0.01	<0.01	0.14	0.14	0.01	60	8	<1	<1	142	142	23	12	49	<1	0.2	4.7	4.27	4.79
06-Mar-23	EB2306934040	-	L021-B01	Downstream (4.5km)	Groundwater	8.02	522	293	<1	<0.001	<0.05	<0.01	<0.01	0.18	0.18	0.01	80	8	<1	<1	124	124	30	15	47	1	0.1	4.9	4.8	1.02
12-Jun-23	EB2318365007	-	L021-B01	Downstream (4.5km)	Groundwater	7.44	600	344	<1	<0.001	<0.05	0.01	<0.01	0.23	0.23	0.01	104	7	<1	<1	133	133	35	18	60	1	0.1	5.74	5.86	1.09
07-Sep-23	EB2328001006	-	L021-B01	Downstream (4.5km)	Groundwater	7.24	630	410	<5	<0.001	<0.05	<0.01	<0.01	0.28	0.28	0.01	120	9	<1	<1	125	125	41	21	65	1	0.1	6.07	6.63	4.39
08-Dec-23	EB2339753016	-	L021-B01	Downstream (4.5km)	Groundwater	7.53	690	485	<1	<0.001	<0.05	<0.01	<0.01	0.48	0.48	0.02	136	10	<1	<1	130	130	45	22	64	1	0.1	6.64	6.86	1.66
Surface Water																													
04-Nov-20	EB2029263061	-	DRD	Onsite - DRD	Surface Water	8.06	5,920	**4,660**	-	-	-	-	-	-	-	-	**1,390**	1,310	<1	<1	102	102	371	237	665	27	**1.7**	68.5	67.6	0.65
26-Oct-21	EB2130810013	-	DRD	Onsite - DRD	Surface Water	7.99	6,490	**5,280**	23	**0.903**	**0.63**	0.18	0.04	0.14	0.18	<0.01	**1,470**	1,380	<1	<1	76	76	461	202	738	25	1	71.7	72.4	0.45
20-Jan-22	EB2202169038	-	DRD	Onsite - DRD	Surface Water	8.33	8,280	**6,530**	56	**0.796**	**0.92**	<0.01	<0.01	<0.01	<0.01	<0.01	**1,850**	1,590	<1	<1	67	67	523	276	946	25	1.1	86.6	90.6	2.24
06-Apr-22	EB2209861007	-	DRD	Onsite - DRD	Surface Water	7.75	10,400	**8,590**	159	**1.190**	**4.54**	0.01	<0.01	<0.01	<0.01	<0.01	**2,820**	2,160	<1	<1	112	112	634	346	1,240	31	1.5	127	115	4.93
13-Jul-22	EB2220736005	-	DRD	Onsite - DRD	Surface Water	7.96	7,250	**6,350**	28	**0.647**	**0.58**	0.10	0.05	0.20	0.25	<0.01	**1,690**	1,600	<1	<1	123	123	451	258	896	23	1.1	83.4	83.3	0.08
26-Oct-22	EB2232600016	-	DRD	Onsite - DRD	Surface Water	8.25	9,680	**7,380**	45	**2.020**	**2.23**	0.04	<0.01	0.01	0.01	<0.01	**2,240**	1,960	<1	<1	110	110	588	357	1,120	27	1.3	106	108	0.9
28-Feb-23	EB2306934009	-	DRD	Onsite - DRD	Surface Water	7.76	12,500	**11,100**	30	**1.100**	0.29	0.07	<0.01	<0.01	<0.01	<0.01	**3,200**	2,590	<1	<1	86	86	1,110	375	1,450	65	0.9	146	151	1.71
06-Jun-23	EB2318365039	-	DRD	Onsite - DRD	Surface Water	7.87	6,620	**5,240**	30	**0.394**	**0.37**	0.05	<0.01	0.24	0.24	0.06	**1,440**	1,240	<1	<1	118	118	394	213	708	24	1.1	68.8	68.6	0.14
28-Jun-23	EB2319880001	-	DRD	Onsite - DRD	Surface Water	7.98	8,590	**7,250**	44	**0.428**	**0.33**	-	-	-	-	-	**1,920**	1,730	<1	<1	105	105	550	298	1,010	28	1.1	92.3	96.6	2.3
04-Sep-23	EB2328001001	-	DRD	Onsite - DRD	Surface Water	7.82	11,200	**10,000**	20	**0.242**	**0.45**	0.08	<0.01	0.01	<0.01	<0.01	**3,020**	2,620	<1	<1	74	74	899	398	1,450	40	1	141	142	0.17
05-Dec-23	EB2339753006	-	DRD	Onsite - DRD	Surface Water	7.98	4,530	**3,750**	47	**0.992**	**0.88**	0.47	0.03	0.42	0.45	0.13	**898**	940	<1	<1	97	97	296	166	454	25	1.2	46.8	48.8	2.07
04-Nov-20	EB2029263062	-	SW01	Background - South of Callide Creek	Surface Water	7.85	297	231	-	-	-	-	-	-	-	-	12	41	<1	<1	135	135	24	10	22	12	0.2	3.04	3.28	3.93
19-Jan-21	EB2101853007	-	SW02	Callide Creek adjacent to SSCA	Surface Water	7.73	1,050	**633**	-	-	**4.74**	-	-	-	-	-	232	63	<1	<1	152	152	51	40	119	4	0.2	10.9	11.1	1.01
18-May-21	EB2114060113	-	SW02	Callide Creek adjacent to SSCA	Surface Water	8.03	419	254	9	**0.103**	0.10	0.02	<0.01	0.09	0.09	<0.01	49	13	<1	<1	133	133	28	16	37	4	0.2	4.31	4.42	1.32
08-Apr-21	EB2109607002	-	SW02	Callide Creek adjacent to SSCA	Surface Water	8.15	1,110	**632**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-May-21	EB2114060037	-	SW02	Callide Creek adjacent to SSCA	Surface Water	8.21	958	**602**	-	0.018	0.05	0.02	<0.01	0.03	0.03	<0.01	185	60	<1	<1	159	159	45	32	94	3	0.2	9.64	9.04	3.21
28-May-21	EB2115500006	-	SW02	Callide Creek adjacent to SSCA	Surface Water	8.13	718	393	1	**0.121**	0.11	0.06	0.02	0.18	0.20	0.02	116	38	<1	<1	154	154	38	25	70	3	0.2	7.14	7.08	0.46
19-Oct-21	EB2130810049	-	SW02	Callide Creek adjacent to SSCA	Surface Water	8.46	1,700	**1,130**	<1	**0.142**	0.14	0.04	<0.01	0.01	0.01	<0.01	**405**	161	<1	9	136	145	54	63	214	3	0.2	17.7	17.3	1.17
01-Dec-21	EB2135860004	CS Energy	SW02	Callide Creek adjacent to SSCA	Surface Water	7.67	1,330	**880**	<5	0.001	<0.05	-	-	-	-	-	**303**	116	<1	<1	159	159	59	46	148	3	0.2	14.1	13.3	3.17
09-Dec-21	EB2137227015	-	SW02	Callide Creek adjacent to SSCA	Surface Water	7.93	867	546	10	**0.100**	**0.79**	0.08	<0.01	0.04	0.04	0.03	158	64	<1	<1	154	154	41	30	92	4	0.1	8.87	8.62	1.41
14-Dec-21	EB2137227008	-	SW02	Callide Creek adjacent to SSCA	Surface Water	7.9	470	290	4	0.060	**0.56**	0.07	0.03	0.06	0.09	0.01	64	18	<1	<1	130	130	28	17	45	4	0.1	4.78	4.86	0.82
16-Dec-21	EB2137227009	-	SW02	Callide Creek adjacent to SSCA	Surface Water	7.89	451	264	3	0.060	**0.42**	0.07	0.05	0.05	0.10	0.01	54	14	<1	<1	129	129	28	16	42	4	0.1	4.39	4.64	2.78
18-Jan-22	EB2202169007	-	SW02	Callide Creek adjacent to SSCA	Surface Water	7.29	399	247	<1	0.090	0.25	0.08	0.02	0.29	0.31	0.03	51	9	<1	<1	123	123	25	13	37	4	0.1	4.08	4.03	0.67
31-Mar-22	EB2209243026	-	SW02	Callide Creek adjacent to SSCA	Surface Water	7.47	800	478	473	**24.600**	**13.60**	0.08	<0.01	<0.01	0.07	0.38	45	4	<1	<1	186	186	41	30	89	4	0.2	8.55	8.49	0.34
06-Jul-22	EB2220051014	-	SW02	Callide Creek adjacent to SSCA	Surface Water	8.11	1,200	**787**	2	**0.144**	0.06	0.02	<0.01	0.20	0.20	0.02	**264**	105	<1	<1	162	162	50	44	148	4	0.2	12.9	12.6	0.84
26-Oct-22	EB2232600014	-	SW02	Callide Creek adjacent to SSCA	Surface Water	8.01	561	328	<5	**0.155**	0.11	0.03	<0.01	0.03	0.03	0.02	76	27	<1	<1	145	145	32	21	55	4	0.2	5.6	5.82	1.9
28-Feb-23	EB2306934008	-	SW02	Callide Creek adjacent to SSCA	Surface Water	8.19	2,670	**2,030**	46	**0.587**	**0.57**	0.04	<0.01	<0.01	<0.01	<0.01	**732**	245	<1	<1	160	160	84	114	312	10	0.2	28.9	27.4	2.74
12-Jun-23	EB2318365044	-	SW02	Callide Creek adjacent to SSCA	Surface Water	7.77	539	329	3	**0.129**	0.12	0.10	0.01	0.04	0.05	0.01	72	17	<1	<1	147	147	34	18	48	4	0.2	5.32	5.37	0.43
03-Nov-20	EB2029263064	-	SW03	Onsite - WSCP	Surface Water	8.1	11,900	**8,500**	-	-	-	-	-	-	-	-	**4,050**	800	<1	<1	663	663	220	443	1,970	2	0.5	144	133	3.96
12-Nov-21	EB2133062006	CS Energy	SW03	Onsite - WSCP	Surface Water	7.64	357	230	16	0.061	**2.99**	-	-	-	-	-	54	27	<1	<1	57	57	8	9	49	2	0.2	3.22	3.35	1.88
17-Nov-21	EB2133256009	-	SW03	Onsite - WSCP	Surface Water	7.86	1,110	**719**	5	0.032	0.26	0.04	<0.01	<0.01	<0.01	0.51	**256**	105	<1	<1	97	97	26	31	163	6	0.2	11.3	11.1	1.13
24-Nov-21	EB2134705001	CS Energy	SW03	Onsite - WSCP	Surface Water	7.9	1,450	**863**	6	0.057	<0.05	<0.01	<0.01	<0.01	<0.01	0.51	**348**	141	<1	<1	126	126	31	41	208	6	0.2	15.3	14.1	3.9
29-Nov-21	EB2134705003	CS Energy	SW03	Onsite - WSCP	Surface Water	8.11	1,610	**903**	20	0.006	<0.05	<0.01	<0.01	<0.01	<0.01	0.40	**370**	126	<1	<1	142	142	25	41	230	6	0.2	15.9	14.7	3.82
03-Dec-21	EB2135860012	CS Energy	SW03	Onsite - WSCP	Surface Water	7.84	1,140	**684**	<5	<0.001	<0.05	-	-	-	-	-	**253**	96	<1	<1	147	147	26	32	164	5	0.2	12.1	11.2	3.78
06-Jul-22	EB2220051006	-	SW03	Onsite - WSCP	Surface Water	8.13	4,540	**3,140**	5	0.025	0.25	<0.01	<0.01	0.03	0.03	0.18	**1,260**	550	<1	<1	187	187	97	166	728	4	0.3	50.7	50.3	0.45
22-Jul-22	EB2221968008	CS Energy	SW03	Onsite - WSCP	Surface Water	8.06	1,720	**1,120**	47	0.002	<0.05	<0.01	<0.01	0.16	0.16	0.58	**454**	196	<1	<1	93	93	34	52	248	4	0.2	18.7	16.9	5.28
06-Jul-22	EB2236118016	CS Energy	SW03	Onsite - WSCP	Surface Water	8.22	3,690	**2,490**	15	0.061	**0.84**	0.35	<0.01	<0.01	0.07	0.19	**995**	433	<1	<1	151	151	86	129	545	4	0.2	40.1	38.7	1.75
01-Dec-22	EB2236118014	CS Energy	SW03	Onsite - WSCP	Surface Water	8.28	3,300	**2,240**	10	0.051	**0.54**	0.12	<0.01	0.06	0.06	0.21	**877**	369	<1	<1	165	165	78	114	471	4	0.2	35.7	33.9	2.66
04-Nov-20	EB2029263063	-	SW04	Onsite - ESCP	Surface Water	7.88	7,100	**5,070**	-	-	-	-	-	-	-	-	**1,720**	1,390	<1	<1	280	280	318	338	907	2	1.4	83	83.2	0.08
12-Nov-21	EB2133256008	-	SW04	Onsite - ESCP	Surface Water	7.87	6,810	**5,880**	<1	**0.740**	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	**1,820**	1,330	<1	<1	258	258	346	349	868	<1	1	84.2	83.7	0.26
24-Nov-21	EB2134705002	CS Energy	SW04	Onsite - ESCP	Surface Water	8.11	7,930	**5,760**	2	0.386	**14.05**	0.03	<0.01	0.03	0.03	0.01	**1,750**	1,450	<1	<1	258	258	337	343	840	<1	1	84.7	81.6	1.88
29-Nov-21	EB2134705004	CS Energy	SW04	Onsite - ESCP	Surface Water	7.58	128	95	3	<0.001	0.07	<0.01	<0.01	<0.01	<0.01	0.01	7	7	<1	<1	50	50	11	4	8	2	0.1	1.34	1.28	-
06-Jul-22	EB2220051001	-	SW06	Western Stormwater Diversion Channel	Surface Water	8.02	1,890	**1,170**	23	0.074	**2.81**	<0.01	<0.01	0.07	0.07	0.11	**447**	217	<1	<1	144	144	42	52	277	5	0.4	20	18.6	3.77
22-Jul-22	EB2221968011	CS Energy	SW06	Western Stormwater Diversion Channel	Surface Water	7.79	456	573	414	<0.001	<0.05	0.02	<0.01	0.21	0.21	0.16	76	48	<1	<1	62	62	10	11	64	5	0.2	4.32	4.32	0.76
04-Mar-21	EB2106063014	-	SW06	Cooling Tower Reservoir	Surface Water	8.24	929	589	-	-	-	-	-	-	-	-	179	58	<1	<1	176	176	41	33	96	4	0.2	9.77	9.04	3.9
04-Nov-20	EB2029263060	-	SW12	Callide Creek adjacent to ESCA	Surface Water	8.06	402	229	5	**0.118**	0.05	0.07	<0.01	0.02	0.02	<0.01	45	5	<1	<1	138	138	26	14	34	4	0.2	4.13	4.03	1.22
20-Jan-21	EB2101853014	-	SW12	Callide Creek adjacent to ESCA	Surface Water	8.03	1,040	**650**	-	-	**0.87**	-	-	-	-	-	227	73	<1	<1	153	153	49	42	118	4	0.2	11	11.1	0.71
18-May-21	EB2114060014	-	SW12	Callide Creek adjacent to ESCA	Surface Water	**8.71**	784	487	10	0.075	0.07	<0.01	<0.01	<0.01	<0.01	0.01	20	118	<1	<1	138	138	38	30	82	3	0.2	7.88	8.01	0.84
20-May-21	EB2114060036	-	SW12	Callide Creek adjacent to ESCA	Surface Water	8.52	395	245	5	**0.102**	0.12	0.02	<0.01	0.09	0.09	<0.01	42	8	<1	<1	123	123	26	15	36	4	0.2	3.81	4.2	4.88
28-May-21	EB2115500004	-	SW12	Callide Creek adjacent to ESCA	Surface Water	8.15	1,030	571	2	**0.340**	0.17	0.06	0.01	0.08	0.09	<0.01	191	71	<1	<1	178	178	45	35	111	3	0.2	10.4	10	1.91
19-Oct-21	EB2130810047	-	SW12	Callide Creek adjacent to ESCA	Surface Water	8.38	1,600	**1,020**	2	**0.109**	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	**368**	148	<1	7	168	174	57	61	196	3	0.2	16.9	16.5	1.41
12-Nov-21	EB2133062009	CS Energy	SW12	Callide Creek adjacent to ESCA	Surface Water	7.57	228	303	288	**0.224**	**11.80**	-	-	-	-	-	15	16	<1	<1	66	66	16	7	17	3	0.2	2.37	2.29	-
18-Jan-22	EB2202169008	-	SW12	Callide Creek adjacent to ESCA	Surface Water	7.06	378	242	8	**1.200**	0.58	0.14	0.02	0.29	0.31	0.03	46	7	<1	<1	124	124	25	12	33	5	0.1	3.92	3.8	1.58
31-Mar-22	EB2209243027	-	SW12	Callide Creek adjacent to ESCA	Surface Water	7.87	684	410	26	**1.700**	**0.41**	0.04	<0.01	0.08	0.08	0.07	109	37	<1	<1	155	155	31	25	69	3	0.2	6.94	6.71	1.71
07-Jul-22	EB2220051023	-	SW12	Callide Creek adjacent to ESCA	Surface Water	8.12	1,020	597	5	**0.633**	0.19	0.04	<0.01	0.13	0.13	0.01	210	83	<1	<1	156	156	40	35	122	3	0.2	10.8	10.3	2.42
26-Oct-22	EB2232600017	-	SW12	Callide Creek adjacent to ESCA	Surface Water	8.2	474	263	16	**0.906**	0.29	0.09	<0.01	0.02	0.02	0.01	53	14	<1	<1	68	68	17	10	14	2	0.2	4.64	4.82	1.92
28-Feb-23	EB2306934007	-	SW12	Callide Creek adjacent to ESCA	Surface Water	8.24	4,730	**3,280**	12	**1.110**	0.25	0.04	<0.01	<0.01	<0.01	0.04	**1,090**	579	<1	<1	276	276	172	210	534	7	0.2	48.3	49.3	0.98
07-Jun-23	EB2318365045	-	SW12	Callide Creek adjacent to ESCA	Surface Water	7.79	480	299	4	**0.222**	0.13	0.10	<0.01	0.02	0.02	0.02	58	11	<1	<1	142	142	31	17	42	4	0.2	4.7	4.88	1.81
04-Sep-23	EB2328001038	-	SW12	Callide Creek adjacent to ESCA	Surface Water	8.29	3,490	**2,390**	5	**0.197**	0.12	0.05	<0.01	<0.01	<0.01	<0.01	**838**	468	<1	<1	242	242	113	147	417	2	0.3	38.2	35.9	3.09
05-Dec-23	EB2339753008	-	SW12	Callide Creek adjacent to ESCA	Surface Water	8.32	4,410	**2,540**	9	**0.205**	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	**953**	542	<1	11	291	302	89	151	571	2	0.4	44.2	41.8	2.84
20-Oct-21	EB2130810048	-	SW13	Western Seepage Trench	Surface Water	8.43	10,100	**7,340**	4	0.075	0.10	0.02	<0.01	<0.01	<0.01	0.01	**2,020**	1,060	<1	24	344	369	169	353	1,670	2	0.4	112	110	0.7
19-Jan-22	EB2202169025	-	SW13	Western Seepage Trench	Surface Water	8.4	19,000	**13,800**	6	0.008	**0.52**	0.02	<0.01	<0.01	<0.01	<0.01	**6,040**	1,880	<1	28	336	362	187	626	3,240	1	0.2	217	202	3.57
06-Jul-22	EB2220051007	-	SW13	Western Seepage Trench	Surface Water	8.3	8,450	**6,920**	3	0.027	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	**2,780**	1,100	<1	<1	336	336	198	362	1,480	3	0.2	108	104	1.84
22-Jul-22	EB2221968004	CS Energy	SW13	Western Seepage Trench	Surface Water	8.1	2,720	**1,850**	240	<0.001	<0.05	0.03	<0.01	0.25	0.25	0.30	**699**	356	<1	<1	122	122	68	94	374	3	0.2	29.6	27.5	3.67
25-Oct-22	EB2232600008	CS Energy	SW13	Western Seepage Trench	Surface Water	8.32	14,000	**8,890**	<5	0.027	0.09	0.02	<0.01	<0.01	<0.01	0.01	**3,930**	1,520	<1	10	416	426	308	552	2,110	2	0.3	151	153	0.53
30-Nov-21	EB2236118015	CS Energy	SW13	Western Seepage Trench	Surface Water	8.36	4,520	**3,100**	26	0.071	**1.20**	0.08	<0.01	0.08	0.08	0.08	**1,190**	582	<1	8	187	196	112	162	661	3	0.3	49.6	47.8	1.9
01-Dec-22	EB2236118013	CS Energy	SW13	Western Seepage Trench	Surface Water	8.45	5,590	**3,930**	3	0.073	0.25	0.06	<0.01	0.05	0.05	0.08	**1,480**	641	<1	21	235	255	132	209	840	3	0.3	60.2	60.4	0.13
27-Feb-23	EB2306934003	-	SW13	Western Seepage Trench	Surface Water	8.01	12,600	**9,070**	22	**0.289**	**0.65**	0.03	<0.01	0.04	0.04	0.01	**3,790**	792	<1	<1	633	633	224	500	1,800	2	0.5	136	131	2.01
05-Dec-23	EB2339753005	-	SW13	Western Seepage Trench	Surface Water	8.29	16,500	**10,800**	37	**0.294**	**1.23**	<0.01	<0.01	<0.01	<0.01	0.01	**4,750**	1,100	<1	<1	290	290	123	514	2,340	3	0.4	163	150	3.96
07-Jul-21	EB2110293012	CS Energy	SW17	Dunn Creek (Downstream of R2)	Surface Water	7.72	499	338	<5	0.015	<0.05	<0.01	0.02	0.02	<0.01	<0.01	44	122	<1	<1	48	48	18	13	65	<1	0.2	-	-	-
01-Dec-21	EB2135860007	CS Energy	SW17	Dunn Creek (Downstream of R2)	Surface Water	7.32	2,840	**2,180**	<5	**0.652**	<0.05	-	-	-	-	-	**364**	930	<1	<1	193	193	153	140	304	4	0.4	33.5	32.5	1.52
19-Jan-22	EB2202169021	-	SW17	Dunn Creek (Downstream of R2)	Surface Water	8.07	3,890	**3,100**	5	**0.477**	0.07	<0.01	<0.01	0.03	0.03	<0.01	**469**	1,140	<1	<1	529	529	192	178	481	4	1.4	47.5	45.2	2.46
10-Mar-22	EB2207080001	CS Energy	SW17	Dunn Creek (Downstream of R2)	Surface Water	8.36	3,400	**2,370**	28	**0.741**	0.17	<0.01	<0.01	<0.50	<0.01	<0.01	**299**	823	<1	27	517	544	150	146	404	3	**2.1**	-	-	-
01-Dec-21	EB2135860006	CS Energy	SW18	Dunn Creek	Surface Water	7.24	3,640	**2,980**	<5	**1.200**	0.12	-	-	-	-	-	**497**	1,220	<1	<1	265	265	223	198	425	5	0.5	44.7	46	1.46
20-Jan-21	EB2101853013	-	SW20	Background - Lake Callide	Surface Water	8.28	386	280	-	-	**0.43**	-	-	-	-	-	49	6	<1	<1	118	118	28	15	33	3	0.2	3.78	4.17	4.9
19-Oct-21	EB2130810050	-	SW20	Background - Lake Callide	Surface Water	8.48	403	242	148	**0.122**	**2.66**	0.07	<0.01	0.01	0.01	<0.01	50	7	<1	<1	114	121	25	16	38	4	0.2	3.97	4.32	4.17
18-Jan-22	EB2202169010	-	SW20	Background - Lake Callide	Surface Water	8.44	349	241	99	0.076	0.78	0.02	<0.01	<0.01	<0.01	<0.01	45	7	<1	<1

07-Jun-23	EB2318365049	-	SW40	Jambin Dakenba Road	Surface Water	7.78	1,030	**633**	6	0.060	0.16	0.02	<0.01	0.03	0.03	0.01	208	15	<1	<1	218	218	69	29	96	2	0.2	10.5	10	2.32	
21-Oct-21	EB2130810073	-	SW41	Callide Wier	Surface Water	8.21	600	376	39	**0.117**	**0.54**	0.02	<0.01	<0.01	<0.01	0.02	121	8	<1	<1	118	118	38	18	53	6	0.2	5.94	5.84	0.86	
24-Jan-22	EB2202169056	-	SW41	Callide Wier	Surface Water	7.49	270	185	21	**0.110**	**0.36**	<0.01	<0.01	0.06	0.06	<0.01	22	2	<1	<1	103	103	23	8	23	0.1	0.2	2.72	2.96	----	
05-Apr-22	EB2209861010	-	SW41	Callide Wier	Surface Water	7.65	594	346	21	**1.570**	**1.19**	<0.01	<0.01	<0.01	<0.01	0.01	90	7	<1	<1	202	202	42	19	56	4	0.2	6.72	6.2	4.05	
07-Jul-22	EB2220051024	-	SW41	Callide Wier	Surface Water	8.21	789	438	5	**0.128**	0.26	0.07	<0.01	0.02	0.02	<0.01	152	12	<1	<1	181	181	53	24	76	4	0.2	8.15	8.03	0.78	
02-Nov-22	EB2232870001	-	SW41	Callide Wier	Surface Water	8.14	667	372	1	0.026	0.06	0.04	<0.01	0.01	0.01	0.01	116	8	<1	<1	183	183	38	20	67	3	0.2	7.1	6.53	4.12	
06-Mar-23	EB2306934038	-	SW41	Callide Wier	Surface Water	8.19	689	442	15	**0.246**	0.21	0.03	<0.01	0.02	0.02	0.08	112	3	<1	<1	176	176	46	21	59	7	0.2	6.74	6.77	0.23	
12-Jun-23	EB2318365050	-	SW41	Callide Wier	Surface Water	7.99	1,020	**625**	11	**0.269**	0.18	0.15	<0.01	0.04	0.04	0.09	209	10	<1	<1	226	226	68	30	98	6	0.2	10.6	10.3	1.63	
08-Dec-23	EB2339753009	-	SW41	Callide Wier	Surface Water	8.1	3,350	**3,300**	17	**0.311**	0.15	<0.01	<0.01	<0.01	<0.01	<0.01	**925**	46	<1	<1	176	176	190	109	257	7	0.2	30.6	29.8	1.25	
19-Oct-21	EB2130787002	-	SW42	Dunn Creek (Downstream of SW17)	Surface Water	7.34	80	85	61	0.053	**3.73**	0.06	<0.01	0.16	0.16	0.03	5	5	<1	<1	21	21	4	2	9	2	0.1	0.83	0.81	-	
26-Oct-21	EB2130787003	-	SW42	Dunn Creek (Downstream of SW17)	Surface Water	8.1	861	571	7	0.075	**1.18**	0.11	<0.01	0.07	0.07	<0.01	82	188	<1	<1	110	110	32	31	112	2	0.6	8.42	9.07	3.69	
12-Nov-21	EB2130620005	CS Energy	SW42	Dunn Creek (Downstream of SW17)	Surface Water	7.77	998	573	26	0.059	**4.65**	-	-	-	-	-	219	81	<1	<1	76	76	16	24	144	5	0.2	9.38	9.16	1.17	
02-Dec-21	EB2135860009	CS Energy	SW42	Dunn Creek (Downstream of SW17)	Surface Water	7.8	2,740	**2,070**	<5	**0.177**	<0.05	-	-	-	-	-	**336**	888	<1	<1	182	182	147	139	293	4	0.4	31.6	31.6	0.03	
07-Jul-22	EB2220051041	-	SW42	Dunn Creek (Downstream of SW17)	Surface Water	8.1	2,500	**1,760**	6	**0.327**	**1.38**	<0.01	<0.01	0.06	0.06	<0.01	242	636	<1	<1	418	418	110	117	310	1	0.9	28.4	28.6	0.36	
01-Nov-22	EB2232870001	-	SW42	Dunn Creek (Downstream of SW17)	Surface Water	8.25	2,900	**2,040**	8	**0.101**	0.18	0.01	<0.01	<0.01	<0.01	<0.01	**292**	762	<1	<1	464	464	122	131	304	2	1.4	33.4	33.4	30.1	
01-Dec-22	EB2236118004	CS Energy	SW42	Dunn Creek (Downstream of SW17)	Surface Water	8.34	2,260	**1,640**	6	0.078	**1.11**	0.02	<0.01	0.03	0.03	<0.01	**278**	628	<1	<1	301	301	311	106	124	258	2	0.8	27.1	26.8	0.67	
21-Mar-21	EB2107988027	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	7.1	73	55	6	0.017	0.14	0.02	<0.01	<0.01	<0.01	<0.01	3	12	<1	<1	13	13	5	2	4	4	0.1	0.59	0.69	-	
19-May-21	EB2114060024	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	6.99	80	82	4	0.031	**2.22**	<0.01	<0.01	<0.01	<0.01	<0.01	6	8	<1	<1	21	21	6	2	5	2	0.2	0.76	0.73	-	
01-Jul-21	EB2119293008	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	6.77	86	81	28			<0.01	<0.01	0.01	0.01	<0.01	6	17	<1	<1	12	12	3	2	6	2	0.1	<1	0.2	-	
21-Oct-21	EB2130810011	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	6.76	113	82	22	**0.180**	**0.87**	0.03	<0.01	0.17	0.17	0.02	4	29	<1	<1	8	8	7	2	5	5	0.1	0.88	0.86	-	
26-Oct-21	EB2130787004	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	7.11	88	72	12	0.048	**0.60**	0.03	<0.01	0.04	0.04	0.01	4	29	<1	<1	17	17	6	2	5	4	0.2	1.05	0.85	-	
08-Dec-21	EB2135860019	CS Energy	SW43	Callide A Eastern Stormwater Pond	Surface Water	7.63	126	97	<5	0.002	0.07	-	-	-	-	-	6	7	<1	<1	53	53	11	4	8	2	0.2	1.37	1.28	3.65	
19-Jan-22	EB2202169019	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	6.71	118	117	20	**0.100**	**2.37**	0.01	<0.01	0.02	0.02	<0.01	6	3	<1	<1	52	52	10	4	9	2	0.2	1.27	1.27	----	
31-Mar-22	EB2209243024	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	7.19	125	101	35	0.077	**2.89**	<0.01	<0.01	<0.01	<0.01	<0.01	12	8	<1	<1	37	37	8	4	10	3	0.3	1.24	1.24	-	
07-Jul-22	EB2220051020	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	7.36	99	59	6	0.009	**0.49**	<0.01	<0.01	0.04	0.04	<0.01	4	10	<1	<1	23	23	8	3	6	3	0.1	0.95	0.98	-	
25-Oct-22	EB2232600002	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	7.29	78	78	31	0.035	**1.54**	<0.01	<0.01	<0.01	<0.01	<0.01	3	10	<1	<1	22	22	5	2	7	3	0.2	0.73	0.8	4.12	
01-Dec-22	EB2236118003	CS Energy	SW43	Callide A Eastern Stormwater Pond	Surface Water	7.56	81	80	26	0.048	**2.46**	<0.01	<0.01	0.18	0.18	<0.01	3	6	<1	<1	32	32	6	3	6	2	0.2	0.85	0.86	-	
28-Feb-23	EB2306934011	-	SW43	Callide A Eastern Stormwater Pond	Surface Water	7.5	100	96	77	**0.117**	**1.93**	0.02	<0.01	<0.01	<0.01	0.01	5	3	<1	<1	35	35	6	3	7	3	0.3	0.9	0.93	-	
21-Mar-21	EB2107988028	CS Energy	SW44	Callide A Northern Stormwater Pond	Surface Water	6.83	111	144	10	**0.281**	**0.76**	0.02	<0.10	<0.01	0.04	0.04	6	6	<1	<1	36	36	7	4	3	9	0.1	0.96	1.04	-	
21-Oct-21	EB2130810012	-	SW44	Callide A Northern Stormwater Pond	Surface Water	6.73	84	82	22	0.098	**0.66**	0.03	<0.01	0.08	0.08	0.24	6	11	<1	<1	15	15	6	2	3	6	0.1	0.7	0.75	-	
26-Oct-21	EB2130787006	CS Energy	SW44	Callide A Northern Stormwater Pond	Surface Water	7.26	63	59	8	0.053	**0.62**	0.04	<0.01	0.03	0.03	0.14	3	7	<1	<1	23	23	5	2	3	4	0.2	0.69	0.65	-	
01-Nov-22	EB2232870001	-	SW44	Callide A Northern Stormwater Pond	Surface Water	6.68	92	116	17	0.068	**0.73**	<0.01	<0.01	0.01	0.01	0.11	4	11	<1	<1	28	28	4	3	4	6	0.2	0.9	0.77	-	
01-Dec-22	EB2236118001	CS Energy	SW44	Callide A Northern Stormwater Pond	Surface Water	7.21	87	104	23	0.077	**0.51**	0.03	<0.01	0.02	0.02	0.10	4	11	<1	<1	29	29	6	3	4	4	0.2	0.92	0.82	-	
03-Dec-21	EB2135860015	CS Energy	SW45	Northern Stormwater Diversion Channel (near BS3)	Surface Water	8.03	433	330	<5	0.001	0.07	-	-	-	-	-	51	45	<1	<1	100	100	18	14	49	4	0.2	4.37	4.31	0.74	
09-Sep-23	EB2328001040	-	SW45	Northern Stormwater Diversion Channel (near BS3)	Surface Water	**8.61**	1,170	**656**	35	**0.102**	**0.70**	0.18	<0.01	<0.01	<0.01	<0.01	198	61	<1	30	279	309	45	194	4	0.8	13	13.1	0.43	
06-Dec-23	EB2339753001	-	SW45	Northern Stormwater Diversion Channel (near BS3)	Surface Water	**9.14**	1,420	**836**	4	0.034	0.11	<0.01	<0.01	<0.01	<0.01	0.02	247	64	<1	74	249	323	16	144	243	5	1.1	14.8	15.1	1.22	
16-Mar-21	EB2107351005	CS Energy	SW46	Western Stormwater Diversion Channel	Surface Water	7.54	996	**649**	53	0.066	**4.10**	-	-	-	-	-	190	136	<1	<1	53	53	53	25	27	129	7	0.2	9.25	9.26	0.05	
06-Jul-22	EB2220051010	-	SW46	Western Stormwater Diversion Channel	Surface Water	8.15	1,470	**937**	20	0.020	**2.00**	<0.01	<0.01	0.05	0.05	0.15	**341**	183	<1	<1	123	123	40	42	219	6	0.3	15.9	15.1	2.43	
22-Jul-59	EB2221968007	CS Energy	SW46	Western Stormwater Diversion Channel	Surface Water	7.8	466	548	709	<0.001	<0.05	<0.01	<0.01	0.31	0.31	0.59	83	52	<1	<1	53	53	14	12	59	6	0.2	4.48	4.41	0.86	
01-Dec-21	EB2135860003	CS Energy	SW47	Road Culvert near MW68	Surface Water	8.09	1,480	**926**	8	<0.001	<0.05	-	-	-	-	-	**340**	126	<1	<1	207	207	59	51	200	8	0.2	16.4	16	0.94	
01-Dec-22	EB2236118005	CS Energy	SW47	Road Culvert near MW68	Surface Water	8.04	207	204	5	0.034	**3.63**	0.01	<0.01	0.01	0.01	0.38	10	6	<1	<1	87	87	14	7	20	1	0.1	2.14	2.32	-	
06-Jul-22	EB2220051009	-	SW48	Western Stormwater Diversion Channel (upstream of SW35)	Surface Water	7.81	1,480	**968**	19	0.021	1.85	<0.01	<0.01	0.06	0.06	0.15	**345**	205	<1	<1	105	105	41	42	219	6	0.3	16.1	15.2	2.93	
21-Oct-21	EB2130787008	-	R2	Callide A Release Point R2	Surface Water	7.99	125	100	20	0.045	**1.44**	0.02	<0.01	<0.01	<0.01	0.29	3	<1	<1	<1	56	56	16	3	4	4	0.2	1.2	1.32	-	
25-Oct-21	EB2130787007	-	R2	Callide A Release Point R2	Surface Water	8.17	180	134	10	0.068	<0.05	0.09	<0.01	<0.01	<0.01	0.15	4	<1	<1	<1	84	84	26	6	5	5	0.2	1.99	2.14	-	
12-Jan-22	EB2200738001	-	R2	Callide A Release Point R2	Surface Water	8.36	1,200	**822**	<1	0.005	<0.05	0.01	<0.01	0.03	0.03	0.06	36	117	<1	23	470	494	26	54	184	<1	**1.8**	13.3	13.7	1.56	
19-Jan-22	EB2202007003	-	R2	Callide A Release Point R2	Surface Water	8.4	1,150	**767**	2	0.003	<0.05	0.03	<0.01	<0.01	<0.01	0.03	30	101	<1	23	482	505	24	49	180	<1	**1.8**	13	13.1	0.08	
23-Feb-22	EB2205271013	-	R2	Callide A Release Point R2	Surface Water	**8.61**	991	**712**	2	0.005	<0.05	0.03	<0.01	<0.01	<0.01	0.04	24	75	<1	47	406	453	19	46	174	<1	**1.8**	11.3	12.3	4.29	
07-Jul-22	EB2220051021	-	R2	Callide A Release Point R2	Surface Water	8.47	640	379	1	0.004	<0.05	0.02	0.02	0.22	0.22	<0.01	22	44	<1	13	240	253	19	22	99	3	0.8	8.59	7.14	4	
01-Dec-22	EB2236118002	CS Energy	R2	Callide A Release Point R2	Surface Water	8.1	1,230	**818**	<1	0.002	<0.05	0.02	<0.01	0.10	0.10	0.09	39	93	<1	<1	523	523	24	48	227	<1	**1.7**	13.5	15	5.39	
26-Oct-21	EB2130787001	-	BS3	BS3	Surface Water	8.02	204	199	10	0.017	**1.69**	<0.01	<0.01	0.04	0.04	0.64	9	20	<1	<1	69	69	16	8	14	3	0.2	2.24	2.27	-	
12-Nov-21	EB2130620004	CS Energy	BS3	BS3	Surface Water	7.48	186	177	26	0.073	**3.46**	-	-	-	-	-	15	27	<1	<1	34	34	8	6	18	4	0.2	1.66	1.78	-	
04-Jul-22	EB2220051044	-	BS3	BS3	Surface Water	8.03	217	213	4	0.017	**3.55**	<0.01	<0.01	<0.01	<0.01	0.04	12	12	<1	<1	79	79	12	7	26	3	0.2	2.17	2.38	-	
06-Jul-22	EB2220051005	-	BS3	BS3	Surface Water	7.94	240	393	9	0.030	**2.39**	0.01	<0.01	0.02	0.02	0.04	11	16	<1	<1	89	89	14	8	25	4	0.2	2.42	2.55	-	
22-Jul-22	EB2221964002	CS Energy	BS3	BS3	Surface Water	7.63	116	192	60	<0.001	<0.05	0.02	<0.01	0.03	0.03	0.18	6	13	<1	<1	36	36	5	4	12	4	0.2	1.16	1.2	-	
21-Oct-21	EB2231621001	CS Energy	BS3	BS3	Surface Water	7.83	186	258	16	0.039	**0.18**	0.01	<0.01	0.02	0.02	0.08	11	8	<1	<1	76	76	11	6	21	5	0.2	2	2	2.08	
01-Dec-22	EB2236118010	CS Energy	BS3	BS3	Surface Water	8.07	244	221	2	0.007	**1.25**	0.04	<0.01	<0.01	<0.01	0.55	12	28	<1	<1	96	96	17	9	19	6	0.2	2.84	2.57	-	
22-Jul-22	EB2221964001	CS Energy	BS3 CW	BS3 Clean Water Drain	Surface Water	7.36	229	452	183	<0.001	0.11	<0.01	<0.01	1.56	1.56	0.02	22	22	<1	<1	27	27	8	6	25	4	0.2	0.91	1.9	2.08	
21-Oct-22	EB2231621002	CS Energy	BS3 CW	BS3 Clean Water Drain	Surface Water	7.67	265	442	56	0.076	**0.82**	<0.01	<0.01	0.01	0.01	<0.01	25	22	<1	<1	79	79	10	6	37	4	0.3	2.74	2.7	-	
01-Dec-22	EB2236118009	CS Energy	BS3 CW	BS3 Clean Water Drain	Surface Water	7.97	266	368	15	0.044	**4.79**	0.02	<0.01	0.01	0.01	0.01	28	21	<1	<1	76	76	14	9	31	4	0.2	2.74	2.89	-	
22-Jul-22	EB2221964003	CS Energy	BS3 CWN	BS3 Clean Water Drain North	Surface Water	7.37	225	285	55	0.002	0.10	0.02	<0.01	0.96	0.96	0.02	36	26	<1	<1	24	24	8	6	24	3	0.2	2.04	2.01	-	
01-Dec-22	EB2236118006	CS Energy	BS3 CWN	BS3 Clean Water Drain North	Surface Water	7.82	327	323	30	0.018	**2.52**	0.04	<0.01	0.04	0.04	0.03	45	32	<1	<1	74	74	18	9	36	3	0.1	3.41	3.28	1.98	
22-Jul-22	EB2221964004	CS Energy	BS3 CWE	BS3 Clean Water Drain East	Surface Water	7.36	430	394	62	<0.001	0.14	<0.01	0.02	0.02	0.02	0.01	88	39	<1	<1	21	21	10	12	49	8	0.1	3.66	3.82	2.21	
21-Oct-22	EB2231621003	CS Energy	BS3 CWE	BS3 Clean Water Drain East	Surface Water	7.49	234	402	92	0.092	**9.83**	0.02	<0.01	0.21	0.21	<0.01	31	15	<1	<1	52	52	7	5	27	2	0.4	2.22	1.99	-	
04-Mar-21	EB2109063015	-	PW1	Ash Dam B (Eastern Impoundment)	Surface Water	7.88	8,200	**4,680**	31	**0.144**	**0.54**	0.03	0.01	0.14	0.15	0.02	**1,390**	1,390	<1	<1	68	68	538	202	648	27	1	69.5	67.4	1.57	
22-Oct-21	EB2130810038	-	PW1	Ash Dam B (Eastern Impoundment)	Surface Water	8.21	8,170	**6,960**	17	**0.127**	**0.44**	0.05	<0.01	0.02	0.02	<0.01	**1,720**	1,720	<1	<1	94	94	482	318	975	26	1.5	92.7	93.3	0.32	
19-Jan-22	EB2202169024	-	PW1	Ash Dam B (Eastern Impoundment)	Surface Water	8.11	8,480	**6,930**	5	0.096	0.36	<0.01	<0.01	0.02	0.02	<0.01	**1,980**	1,680	<1	<1	84	84	488	290	988	22	1.4	92.5	91.8	0.41	
06-Apr-22	EB2209861006	-	PW1	Ash Dam B (Eastern Impoundment)	Surface Water	8.03	9,760	**7,740**	11	**0.131**	0.25	0.02	<0.01	0.01	0.01	<0.01	**2,520**	1,900	<1	<1	102	102	518	343	1,160	26	1.4	113	105	3.43	
12-Jul-22	EB2220738006	-	PW1	Ash Dam B (Eastern Impoundment)	Surface Water	8.15	8,550	**7,230**	6	0.074	0.08	0.06	0.02	0.05	0.07	<0.01	**2,230**	1,890	<1	<1	118	118	485	328	1,060	24	1.3	105	97.9	3.3	
25-Oct-22	EB2232600003	-	PW1	Ash Dam B (Eastern Impoundment)	Surface Water	8.17	10,400	**6,790**	<5	**0.110**	0.11	0.04	<0.01	<0.01	<0.01	<0.01	**2,280**	1,900	<1	<1	105	105	565	380	1,160	25	1.3	106	110	2.12	
28-Feb-23	EB2306934010	-	PW1	Ash Dam B (Eastern Impoundment)	Surface Water	8.06	10,600	**9,250**	4	0.061	0.13	0.03	<0.01	<0.01	<0.01	<0.01	**2,700**	2,060	<1	<1	71	71	670	458	1,240	41	1.2	120	126	2.29	
12-Jun-23	EB2318365042	-	PW1	Ash Dam B (Eastern Impoundment)	Surface Water	7.87	8,040	**6,000**	12	**0.235**	**0.32**	0.14	0.03	0.12	0.15	<0.01	**1,760**	1,580	<1	<1	125	125	482	267	857	25	1.2	85	83.9	0.65	
08-Jun-22	EB2216789015	-	ADB-SW01-0.0	Ash Dam B Eastern Impoundment (Surface, 0.0m)	Surface Water	8.21	8,940	**7,240**	8	0.080	0.10	<0.01	<0.01	<0.01	<0.01	<0.01	**2,450**	1,870	<1	<1	112	112	532	347	1,090	25	1.4	110	103	3.36	
08-Jun-22	EB2216789006	-	ADB-SW01-3.0	Ash Dam B Eastern Impoundment (Subsurface, 3.0m)	Surface Water	8.15	8,910	**7,210**	10	0.092	0.17	<0.01	<0.01	<0.01	<0.01	<0.01	**2,440**	1,900	<1	<1	113	113	557	366	1,130	26	1.4	111	108	1.33	
08-Jun-22	EB2216789007	-	ADB-SW01-4.0	Ash Dam B Eastern Impoundment (Subsurface, 4.0m)	Surface Water	8.14	8,950	**7,250**	10	0.092	0.18	0.01	<0.01	<0.01	<0.01	<0.01	**2,410**	1,940	<1	<1	112	112	544	357	1,110	25	1.4	111	105	2.39	
08-Jun-22	EB2216789004	-	ADB-SW01-5.0	Ash Dam B Eastern Impoundment (Subsurface, 5.0m)	Surface Water	8.13	8,980	**7,310**	10	0.093	0.20	0.02	<0.01	0.02	0.02	<0.01	**2,470**	1,880	<1	<1	113	113	540	355	1,100	25	1.4	111	105	2.98	
04-Mar-21	B3210900311	-	PW2	Ash Dam B (Western Impoundment)	Surface Water	8.11	9,930	**7,820**	6	0.037	0.08	<0.01	<0.01	0.11	0.11	<0.01	**2,550**	2,170	<1	<1	92	92	606	365	1,170	33	**2.4**	119	112	3	
22-Oct-21	EB2130810039	-	PW2	Ash Dam B (Western Impoundment)	Surface Water	8.11	7,970	**6,530**	2,230	**0.735**	**8.94**	0.03	<0.01	0.01	0.01	<0.01	**1,900**	1,620	<1	<1	107	107	453	312	967	25	**1.6**	89.5	91	0.84	
19-Jan-22	EB2202169031	-	PW2	Ash Dam B (Western Impoundment)	Surface Water	8.08	8,530	**6,900**	10	0.042	0.18	0.02	<0.01	<0.01	<0.01	<0.01	**1,960**	1,610	<1	<1	97	97	484	275	938	23	1.4	90.7	88.2	1.44	
05-Apr-22	EB2209861008	-	PW2	Ash Dam B (Western Impoundment)	Surface Water	8.07	9,090	**7,500**	8	**0.123**	0.16	0.02	<0.01	<0.01	<0.01	<0.01	**2,420**	1,820	<1	<1	108	108	501	326	1,110	26	1.5	108	101	3.6	
12-Jul-22	EB2220736004	-	PW2	Ash Dam B (Western Impoundment)	Surface Water	8.13	9,330	**7,800**	28	0.051	0.11	0.02	0.02	0.03	0.05	<0.01	**2,380**	2,020	<1	<1	114	114	519	368	1,190	26	**1.6**	111	109	1.3	
25-Oct-22	EB2232600001	-	PW2	Ash Dam B (Western Impoundment)	Surface Water	8.18	10,400	**6,970**	8	0.058	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	**2,510**	1,980	<1	<1	115	115	566	394	1,200	24	1.5	114	113	0.37	
27-Feb-23	EB2306934001	-	PW2	Ash Dam B (Western Impoundment)	Surface Water	8.04	10,400	**8,950**	11	0.071	0.10	0.04	<0.01	<0.01	<0.01	<0.01	**2,620**	2,060	<1	<1	80	80	637	435	1,170	39	1.3	118	119	0.46	
06-Jun-23	EB2318365043	-	PW2	Ash Dam B (Western Impoundment)	Surface Water	7.97	10,700	**8,450**	8	0.034	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	**2,700**	2,190	<1	<1	102	102	603	370	1,170	29	1.4	122	112	4.45	
04-Sep-23	EB2328001031	-	PW2	Ash Dam B (Western Impoundment)	Surface Water	7.94	11,200	**9,050**	9	0.054	0.20	0.08	<0.01	<0.01	<0.01	<0.01	**2,960**	2,310	<1	<1	94	94	678	423	1,310	29	1.3	133	126	2.73	
05-Dec-23	EB2339753004	-	PW2	Ash Dam B (Western Impoundment)	Surface Water	8.04	11,500	**9,460**	11	0.061	0.20	0.02	<0.01	0.02	0.02	<0.01	**2,600**	2,690	<1	<1	91	91	649	413	1,240	29	1.3	137	121	9.61	
08-Jun-22	EB2216789012	-	ADB-SW02-0.0	Ash Dam B Western Impoundment (Surface, 0.0m)	Surface Water	8.01	8,980	**7,440**	6	0.067	0.28	0.12	0.04	0.06	0.10	<0.01	**2,450**	1,900	<1	<1	111	111	542	361	1,150	26	**1.7**	111	106	2.39	
08-Jun-22	EB2216789011	-	ADB-SW02-5.0	Ash Dam B Western Impoundment (Subsurface, 5.0m)	Surface Water	8.03	8,980	**7,360**	6	0.070	0.28	0.12	0.04	0.06	0.10	<0.01	**2,450**	1,870	<1	<1	111	111	544	363	1,120	26	**1.6**	110	106	1.78	
08-Jun-22	EB2216789010	-	ADB-SW02-7.0	Ash Dam B Western Impoundment (Subsurface, 7.0m)	Surface Water	8.03	8,990	**7,360**	7	0.073	**0.30**	0.12	0.04	0.06	0.10	<0.01	**2,460**	1,910	<1	<1	111	111	535	359	1,110	26	**1.7**	111	105	2.74	
08-Jun-22	EB2216789009	-	ADB-SW02-9.0	Ash Dam B Western Impoundment (Subsurface, 9.0m)	Surface Water	8.03	9,010	**7,360**	12	**0.102**	**0.61**	0.11	0.04	0.06	0.10	<0.01	**2,480**	2,000	<1	<1	110	110	541	362	1,110	26	**1.7**	114	106	3.67	
08-Jun-22	EB2216789008	-	ADB-SW02-10.0	Ash Dam B Western Impoundment (Subsurface, 10.0m)	Surface Water	8.03	8,990	**7,330**	14	0.064	0.10	0.04	0.04	0.06	0.10	<0.01	**2,480**	1,930	<1	<1	112	112	546	368	1,140	26	**1.6**	112	106	2.09	
11-Dec-23	EB2339725009	-	ADB PW3	Ash Dam B - Spillway South	Surface Water	7.16	11,400	**9,480**	13	**0.279**	**0.27**	<0.01	<0.01	0.01	0.01	<0.01	**2,870**	2,390	<1	<1	98	98

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T4: Sediment Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (mg/kg)	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg)											Perfluoroalkyl Sulfonamides (mg/kg)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg)				Total PFAS (mg/kg)		
							PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
PFAS NEMP Human Health - Residential with garden/accessible soil (HIL-A)						-	-	-	-	-	-	-	**0.01**	-	-	-	-	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Human Health - Industrial/Commercial (HIL-D)						-	-	-	-	-	-	-	**20**	-	-	-	-	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Interim Soil - Ecological Indirect Exposure						-	-	-	-	-	**0.01**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Interim Soil - Ecological Direct Exposure						-	-	-	-	-	**1.0**	-	-	-	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (mg/kg) - Standard Analysis						1	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0012	0.0005	0.0012	0.0012	0.0012	0.0012	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	-	-
Laboratory Level of Reporting (mg/kg) - TOPA						-	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Callide Creek																																							
04-Nov-20	-	SW01-SED	Callide Creek	Sediment	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	-	-
18-May-21	EB2114060012	SW02-SED	Callide Creek	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
04-Nov-20	-	SW12-SED	Callide Creek	Sediment	Standard	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-
19-May-21	EB2114060029	SW12-SED	Callide Creek	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
18-May-21	EB2114060016	SW22-SED	Callide Creek	Sediment	Standard	-	<0.0010	<0.0010	**0.0011**	<0.0010	**0.0037**	<0.0010	**0.0048**	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0048**	-	-
Dunn Creek																																							
04-Nov-20	-	SW17-SED	Dunn Creek	Sediment	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	-	-
19-May-21	EB2114060023	SW18-SED	Dunn Creek	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0008**	<0.0002	**0.0008**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0008**	-	-
19-May-21	EB2114060028	SW36-SED	Downstream - Dunn Creek	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
Surface Water Channels																																							
21-Jan-22	EB2202007008	SW29-SED	Northern Watercourse (Shorts Road)	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
19-May-21	EB2114060020	SW37-SED	Upstream - Northwestern Corner	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
19-May-21	EB2114060022	SW38-SED	Downstream - Northwestern Corner	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0003**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0003**	-	-
19-May-21	EB2114060021	SW39-SED	Onsite - Northwestern Dam	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
Ash Dam B																																							
19-May-21	EB2114060032	Borrow-Pit-A-SED	Borrow Pit A	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
19-May-21	EB2114060033	Borrow-Pit-B-SED	Borrow Pit B	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
27-Aug-21	EB2124278002	EDD	Eastern Dirty Drain	Sediment	Standard	-	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0022**	<0.0002	**0.0026**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0026**	-	-
09-Jun-22	EB2216772041	CDX-1	Creek Dam X	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0009	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
04-Nov-20	-	DRD-SED	DRD	Sediment	Standard	<1.0	<0.0010	<0.0010	**0.0011**	<0.0010	**0.0067**	<0.0010	**0.0078**	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0078**	-	-
04-Nov-20	-	DRD-SED	DRD	Sediment	TOPA	-	<0.0002	<0.0002	**0.0012**	<0.0002	**0.0042**	<0.0002	**0.0054**	<0.001	<0.0002	<0.0002	<0.0002	**0.0002**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.006**	**0.006**	**0.0039**
04-Nov-20	-	DRD-SED2	DRD	Sediment	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0008	<0.0005	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	-	-
04-Nov-20	-	DRD-SED3	DRD	Sediment	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	-	-
08-Jun-22	EB2216772032	ADB-SW01	Ash Dam B Eastern Impoundment	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0024	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
08-Jun-22	EB2216772033	ADB-SW02	Ash Dam B Western Impoundment	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0038	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
11-Dec-23	EB2339725001	ADB-SED-1	Ash Dam B - Spillway South	Sediment	Standard	-	<0.0002	<0.0002	**0.0006**	<0.0002	**0.0081**	<0.0002	**0.0087**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0089**	-	-
11-Dec-23	EB2339725002	ADB-SED-2	Ash Dam B - Spillway Centre	Sediment	Standard	-	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0035**	<0.0002	**0.0038**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0038**	-	-
11-Dec-23	EB2339725003	ADB-SED-3	Ash Dam B - Spillway North	Sediment	Standard	-	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0026**	<0.0002	**0.003**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.003**	-	-
Northern Stormwater Diversion Channel																																							
19-May-21	EB2114060017	SW34-SED	Northern Railway Crossing - Culvert near MW74	Sediment	Standard	-	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0014**	<0.0002	**0.0019**	<0.001	**0.0008**	**0.0005**	**0.0004**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0038**	-	-
06-Jun-22	EB2216772003	NSDC1	Northern Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	**0.0019**	<0.0002	**0.0139**	<0.0002	**0.0158**	**0.003**	**0.0098**	**0.0039**	**0.0026**	**0.0014**	**0.0007**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0374**	-	-
06-Jun-22	EB2216772004	NSDC2	Northern Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0072**	<0.0002	**0.0076**	<0.001	<0.0010	**0.0005**	**0.0005**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.009**	-	-
06-Jun-22	EB2216772005	NSDC3	Northern Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0036**	<0.0002	**0.0041**	<0.001	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0041**	-	-
06-Jun-22	EB2216772006	NSDC4	Northern Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0024**	<0.0002	**0.0024**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0024**	-	-
06-Jun-22	EB2216772007	SW45	Northern Stormwater Diversion Channel (Pig Lake)	Sediment	Standard	-	<0.0002	<0.0002	**0.0006**	<0.0002	**0.0042**	<0.0002	**0.0048**	<0.001	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0048**	-	-
Western Stormwater Diversion Channel																																							
07-Jun-22	EB2216772027	WSDC-1	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0010	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
07-Jun-22	EB2216772028	WSDC-2	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0033**	<0.0002	**0.0033**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0036**	-	-
07-Jun-22	EB2216772029	WSDC-3	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0006**	<0.0002	**0.0006**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0006**	-	-
07-Jun-22	EB2216772030	WSDC-4	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0034**	<0.0002	**0.0034**	<0.001	<0.0002	<0.0006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0034**	-	-
07-Jun-22	EB2216772031	WSDC-5	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
09-Jun-22	EB2216772048	SW35-0.0	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0029**	<0.0002	**0.0034**	<0.001	**0.0003**	<0.0002	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0039**	-	-
09-Jun-22	EB2216772049	SW35-0.2	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
09-Jun-22	EB2216772050	SW35-0.3	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0010**	<0.0002	**0.0013**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0013**	-	-
09-Jun-22	EB2216772051	SW46-0.0	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0002**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0002**	-	-
09-Jun-22	EB2216772052	SW46-0.4	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
09-Jun-22	EB2216772053	SW46-0.6	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0024**	**0.0014**	**0.0024**	<0.001	<0.0002	**0.0002**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0043**	-	-
10-Jun-22	EB2216772060	SW28-0.0	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0004**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0004**	-	-
10-Jun-22	EB2216772061	SW28-0.2	Western Stormwater Diversion Channel	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0006**	<0.0002	**0.0006**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0006**	-	-
Western Seepage Collection Trench																																							
07-Jun-22	EB2216772023	WSCT1	Western Seepage Collection Trench	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0007	<0.0002	**0.0076**	<0.0002	**0.0076**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0076**	-	-
07-Jun-22	EB2216772024	WSCT2	Western Seepage Collection Trench	Sediment	Standard	-	<0.0002	<0.0002	**0.0008**	<0.0002	**0.0040**	<0.0002	**0.0048**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0048**	-	-
07-Jun-22	EB2216772025	WSCT3	Western Seepage Collection Trench	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
07-Jun-22	EB2216772026	WSCT4	Western Seepage Collection Trench	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0011**	<0.0002	**0.0011**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0011**	-	-
07-Jun-22	EB2216772022	SW13	Western Seepage Collection Trench	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0015	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
07-Jun-22	EB2216772017	Notch-V1	Western Seepage Collection Trench	Sediment	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
07-Jun-22	EB2216772018	Notch-V2-0.1	Western Seepage Collection Trench	Sediment	Standard	-	<0

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T4: Soil Ash Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (mg/kg)	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg)						Perfluorooalkyl Carboxylic Acids (PCA) (mg/kg)										Perfluoroalkyl Sulfonamides (mg/kg)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg)				Total PFAS (mg/kg)		
							PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
PFAS NEMP Human Health - Residential with garden/accessible soil (HIL-A)						-	-	-	-	-	-	-	**0.01**	-	-	-	-	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Human Health - Industrial/Commercial (HIL-D)						-	-	-	-	-	-	-	**20**	-	-	-	-	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Interim Soil - Ecological Indirect Exposure						-	-	-	-	-	**0.01**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Interim Soil - Ecological Direct Exposure						-	-	-	-	-	**1.0**	-	-	-	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (mg/kg) - Standard Analysis						1	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0012	0.0005	0.0012	0.0012	0.0012	0.0012	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	-	-
Laboratory Level of Reporting (mg/kg) - TOPA						-	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002
Fuel Oil Tanks																																							
03-Nov-20	EB2029263033	BH1-0.1-0.2	Fuel Oil Tanks	Soil	Standard	<1.0	<0.0010	<0.0010	**0.0059**	**0.0013**	**0.563**	<0.0010	**0.572**	<0.005	**0.0014**	**0.0014**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.5730**	-	-
03-Nov-20	EB2030235033	BH1-0.1-0.2	Fuel Oil Tanks	Soil	TOPA	-	**0.0006**	<0.0005	**0.0051**	**0.0013**	**0.349**	<0.0005	**0.354**	<0.003	**0.0032**	**0.0219**	**0.0008**	**0.001**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0005	<0.0013	<0.0013	<0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.383**	**0.3830**	**0.248**
03-Nov-20	EB2030235034	BH1-0.3-0.4	Fuel Oil Tanks	Soil	Standard	-	**0.0413**	**0.0493**	**0.37**	**0.0241**	**1.34**	<0.0050	**1.71**	<0.025	**0.0284**	**0.155**	**0.0096**	**0.0279**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0126	<0.0050	<0.0126	<0.0126	<0.0126	<0.0126	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**2.04**	-	-
03-Nov-20	EB2029263035	BH2-0.0-0.1	Fuel Oil Tanks	Soil	Standard	<1.0	**0.0009**	**0.0012**	**0.0114**	**0.0008**	**0.0415**	**0.0036**	**0.0561**	<0.002	**0.0006**	**0.0012**	<0.0005	**0.0008**	<0.0005	<0.0005	<0.0005	<0.0005	**0.0014**	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0631**	-	-
03-Nov-20	EB2030235035	BH2-0.0-0.1	Fuel Oil Tanks	Soil	TOPA	-	**0.0008**	**0.0011**	**0.0109**	**0.0007**	**0.034**	**0.0024**	**0.0449**	<0.001	**0.0013**	**0.0061**	**0.0006**	**0.0011**	<0.0002	<0.0002	<0.0002	**0.0003**	**0.0005**	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0598**	**0.0574**	**0.0385**
03-Nov-20	EB2030235037	BH2-0.3-0.4	Fuel Oil Tanks	Soil	Standard	-	<0.0050	<0.0050	**0.0094**	<0.0050	**1.17**	<0.0050	**1.18**	<0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0125	<0.0050	<0.0125	<0.0125	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**1.18**	-	-
03-Nov-20	EB2029263039	BH3-0.0-0.1	Fuel Oil Tanks	Soil	Standard	<1.0	<0.0010	<0.0010	**0.0065**	<0.0010	**0.228**	**0.0175**	**0.239**	<0.005	**0.0012**	<0.0010	<0.0010	<0.0010	**0.0025**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.2560**	-	-
03-Nov-20	EB2030235039	BH3-0.0-0.1	Fuel Oil Tanks	Soil	TOPA	-	<0.0005	<0.0005	**0.0071**	**0.0012**	**0.2**	**0.0078**	**0.207**	<0.003	**0.0028**	**0.0078**	**0.0031**	**0.0082**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0005	<0.0013	<0.0013	<0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.238**	**0.2300**	**0.154**
03-Nov-20	EB2030235041	BH3-0.4-0.5	Fuel Oil Tanks	Soil	Standard	-	<0.0050	<0.0050	<0.0050	<0.0050	**0.376**	<0.0050	**0.376**	<0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0126	<0.0050	<0.0126	<0.0126	<0.0126	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**0.376**	-	-
03-Nov-20	EB2029263043	BH04-0.0-0.1	Fuel Oil Tanks	Soil	Standard	<1.0	<0.0005	<0.0005	**0.001**	<0.0005	**0.0545**	<0.0005	**0.0586**	<0.002	**0.0008**	**0.0006**	**0.0009**	**0.0008**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0586**	-	-
03-Nov-20	EB2030235043	BH4-0.0-0.1	Fuel Oil Tanks	Soil	TOPA	-	<0.0002	<0.0002	**0.0008**	<0.0002	**0.0436**	**0.0002**	**0.0444**	<0.001	**0.0007**	**0.0008**	**0.0007**	**0.001**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0441**	**0.0479**	**0.0312**
03-Nov-20	EB2030235045	BH4-0.4-0.5	Fuel Oil Tanks	Soil	Standard	-	<0.0050	<0.0050	<0.0050	<0.0050	**0.1**	<0.0050	**0.1**	<0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0125	<0.0050	<0.0125	<0.0125	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**0.1**	-	-
13-Oct-21	EB2129940036	FOT01-0.0	Fuel Oil Tanks	Soil	Standard	-	<0.0002	**0.0002**	**0.0027**	**0.0004**	**0.0322**	**0.0022**	**0.0349**	<0.001	<0.0002	**0.0006**	<0.0002	**0.0005**	**0.0003**	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0394**	-	-
13-Oct-21	EB2129940037	FOT01-0.3	Fuel Oil Tanks	Soil	Standard	-	<0.0002	<0.0002	**0.0043**	**0.0007**	**0.0428**	**0.0009**	**0.0471**	<0.001	<0.0002	**0.0004**	<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0503**	-	-
13-Oct-21	EB2129940038	FOT02-0.0	Fuel Oil Tanks	Soil	Standard	-	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0185**	**0.0004**	**0.0189**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0193**	-	-
13-Oct-21	EB2129940039	FOT02-0.5	Fuel Oil Tanks	Soil	Standard	-	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0147**	<0.0002	**0.015**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0150**	-	-
13-Oct-21	EB2129940040	FOT02-1.0	Fuel Oil Tanks	Soil	Standard	-	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0304**	<0.0002	**0.0309**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0309**	-	-
13-Oct-21	EB2129940042	FOT02-2.0	Fuel Oil Tanks	Soil	Standard	-	<0.0002	<0.0002	**0.0019**	**0.0009**	**0.0656**	<0.0006	**0.0675**	<0.001	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0688**	-	-
13-Oct-21	EB2129940043	FOT03-0.0	Fuel Oil Tanks	Soil	TOPA	-	**0.0014**	**0.0011**	**0.0056**	<0.0002	**0.0238**	**0.0043**	**0.0294**	**0.002**	**0.0007**	**0.0007**	**0.0003**	**0.0007**	**0.0007**	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0417**	-	-
13-Oct-21	EB2129940044	FOT03-0.5	Fuel Oil Tanks	Soil	Standard	-	**0.0002**	**0.0003**	**0.0028**	<0.0002	**0.0491**	<0.0004	**0.0519**	<0.001	**0.0003**	**0.0004**	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0534**	-	-
13-Oct-21	EB2129940045	FOT03-1.0	Fuel Oil Tanks	Soil	Standard	-	**0.0014**	**0.0016**	**0.0043**	**0.0016**	**0.145**	<0.0002	**0.149**	<0.001	**0.0003**	**0.0004**	<0.0002	**0.0006**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1550**	-	-
13-Oct-21	EB2129940046	FOT03-1.6	Fuel Oil Tanks	Soil	Standard	-	**0.0004**	**0.0007**	**0.0096**	**0.0035**	**0.0895**	<0.0002	**0.0991**	<0.001	<0.0002	**0.0003**	<0.0002	**0.0022**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1060**	-	-
13-Oct-21	EB2129940047	FOT04-0.0	Fuel Oil Tanks	Soil	TOPA	-	**0.0016**	**0.0008**	**0.0072**	**0.0013**	**0.179**	**0.0044**	**0.186**	**0.01**	**0.0019**	**0.0015**	<0.0002	**0.0009**	**0.0004**	<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.2040**	**0.01**	-
13-Oct-21	EB2131497024	FOT04-0.0	Fuel Oil Tanks	Soil	TOPA	**0.13**	**0.0017**	<0.0005	**0.0061**	**0.0006**	**0.143**	**0.0030**	**0.149**	<0.005	**0.0028**	**0.0064**	<0.0005	**0.0008**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0005	<0.0013	<0.0013	<0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1640**	**0.1610**	**0.106**
13-Oct-21	EB2129940048	FOT04-0.3	Fuel Oil Tanks	Soil	Standard	-	<0.0010	<0.0010	**0.0013**	<0.0010	**0.0206**	<0.0010	**0.0219**	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0219**	-	-
13-Oct-21	EB2129940049	FOT04-0.5	Fuel Oil Tanks	Soil	Standard	-	<0.0010	<0.0010	<0.0010	<0.0010	**0.0373**	<0.0010	**0.0373**	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0373**	-	-
13-Oct-21	EB2129940050	FOT05-0.5	Fuel Oil Tanks	Soil	Standard	-	<0.0025	<0.0025	**0.0341**	<0.0025	**0.172**	<0.0025	**0.206**	<0.012	<0.0025	<0.0025	<0.0025	**0.0028**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0063	<0.0025	<0.0063	<0.0063	<0.0063	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	**0.2090**	-	-
13-Oct-21	EB2131497025	FOT05-1.0	Fuel Oil Tanks	Soil	Standard	-	**0.0061**	**0.0128**	**0.0626**	**0.0080**	**0.697**	<0.0002	**0.0896**	<0.002	**0.0013**	**0.0213**	**0.0049**	**0.0094**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1130**	-	-
13-Oct-21	EB2131497026	FOT05-1.5	Fuel Oil Tanks	Soil	Standard	-	**0.0074**	**0.0032**	**0.0029**	<0.0002	<0.0002	<0.0002	**0.0029**	<0.001	**0.002**	**0.0109**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0264**	-	-
13-Oct-21	EB2131497027	FOT05-2.0	Fuel Oil Tanks	Soil	Standard	-	**0.0017**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	**0.0005**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0026**	-	-
13-Oct-21	EB2129940054	FOT06-0.0	Fuel Oil Tanks	Soil	Standard	-	<0.0005	<0.0005	**0.0026**	<0.0005	**0.0852**	<0.0005	**0.0878**	**0.00**	**0.0024**	**0.0015**	**0.0006**	**0.0011**	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0005	<0.0013	<0.0013	<0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0970**	-	-
13-Oct-21	EB2131497028	FOT06-0.0	Fuel Oil Tanks	Soil	TOPA	**0.23**	**0.0003**	<0.0002	**0.002**	<0.0002	**0.0864**	<0.0006	**0.0884**	<0.003	**0.0028**	**0.0021**	**0.0006**	**0.0009**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0954**	**0.0954**	**0.0617**
13-Oct-21	EB2129940055	FOT06-0.5	Fuel Oil Tanks	Soil	Standard	-	<0.0050	<0.0050	**0.0048**	<0.0050	**0.182**	<0.0050	**0.237**	<0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0126	<0.0050	<0.0126	<0.0126	<0.0126	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**0.2370**	-	-
13-Oct-21	EB2129940056	FOT06-1.0	Fuel Oil Tanks	Soil	Standard	-	**0.0006**	**0.0028**	**0.0536**	**0.0012**	**0.0263**	<0.0002	**0.0799**	<0.001	**0.0008**	**0.0031**	**0.0004**	**0.0012**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0900**	-	-
13-Oct-21	EB2131497029	FOT06-1.7	Fuel Oil Tanks	Soil	Standard	-	**0.0074**	**0.0226**	**0.0635**	**0.0044**	**0.0727**	<0.0002	**0.135**	<0.002	**0.0032**	**0.0350**	**0.0012**	**0.0085**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1430**	-	-
13-Oct-21	EB2129940058	FOT07-0.0	Fuel Oil Tanks	Soil	Standard	-	**0.0009**	**0.0006**	**0.0151**	**0.0035**	**0.3**	**0.0023**	**0.315**	**0.00**	**0.0016**	**0.0018**	**0.0004**	**0.0031**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	**0.0003**	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.3320**	-	-
13-Oct-21	EB2131497030	FOT07-0.5	Fuel Oil Tanks	Soil	TOPA	**0.3**	<0.0010	<0.0010	**0.0094**	**0.0013**	**0.26**	<0.0010	**0.268**	<0.005	<0.0010	**0.0032**	<0.0010	**0.0020**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0026	<0.0010	<0.0026	<0.0026	<0.0026	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.2760**	**0.2760**	**0.178**
13-Oct-21	EB2129940059	FOT07-0.5	Fuel Oil Tanks	Soil	Standard	-	**0.0242**	**0.0245**	**0.126**	**0.0134**	**0.529**	<0.0002	**0.655**	<0.001	**0.0174**	**0.0507**	**0.0024**	**0.0081**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	**0.0012**	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.8020**	-	-
13-Oct-21	EB2131497031	FOT07-0.5	Fuel Oil Tanks	Soil	Standard	**0.54**	**0.0413**	**0.0202**	**0.111**	**0.0111**	**0.874**	<0.0026	**1.06**	<0.013	**0.0333**	**0.1040**	**0.0048**	**0.0117**	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	<0.0066	<0.0026	<0.0066	<0.0066	<0.0066	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	**1.2900**	**1.2900**	**0.827**
13-Oct-21	EB2131497032	FOT07-1.0	Fuel Oil Tanks	Soil	Standard	-	**0.0163**	**0.0098**	**0.533**	**0.0409**	**1.49**	<0.0025	**2.02**	<0.012	**0.0027**	**0.0141**	**0.0096**	**0.0255**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0063	<0.0025	<0.0063	<0.0063	<0.0063	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	**2.3400**	-	-
13-Oct-21	EB2131497033	FOT07-1.5	Fuel Oil Tanks	Soil	Standard	-	**0.0067**	**0.0177**	**0.213**	**0.015**	**0.211**	<0.0005	**0.424**	<0.002	**0.0027**	**0.0234**	**0.0039**	**0.0163**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.5100**	-	-
13-Oct-21	EB2131497034	FOT08-0.0	Fuel Oil Tanks	Soil	Standard	-	**0.0020**	**0.0096**	**0.103**	**0.0242**	**0.168**	<0.0010	**0.471**	<0.005	**0.0013**	**0.0089**	**0.0028**	**0.03**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.5500**	-	-
13-Oct-21	EB2129940063	FOT08-0.0	Fuel Oil Tanks	Soil	Standard	-	<0.0010	<0.0010	**0.0016**	<0.0010	**0.171**	<0.0016	**0.173**	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.1730**	-	-
13-Oct-21	EB2129940064	FOT08-0.5	Fuel Oil Tanks	Soil	Standard	-	**0.0246**	**0.019**	**0.357**	**0.0234**	**0.998**	<0.0050	**1.36**	<0.025	<0.0050	**0.0376**	<0.0050	**0.0162**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0125	<0.0050	<0.0125	<0.0125	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**1.5100**	-	-
13-Oct-21	EB2131497035	FOT08-0.5	Fuel Oil Tanks	Soil	TOPA	**1.53**	**0.0293**	**0.0235**	**0.357**	**0.029**	**1.41**	<0.0026	**1.77**	<0.013	**0.0246**	**0.1740**	**0.0043**	**0.0183**	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	<0.0066	<0.0026	<0.0066	<0.0066	<0.0066	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	**2.0700**	**2.0700**	**1.33**
13-Oct-21	EB2131497036	FOT08-1.0	Fuel Oil Tanks	Soil	Standard	-	**0.0264**	**0.0497**	**0.626**	**0.0373**	**0.469**	<0.0025	**1.1**	<0.013	**0.0077**	**0.0588**	**0.0093**	**0.0445**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0063	<0.0025	<0.0063	<0.0063	<0.0063	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	**1.3300**	-	-
13-Oct-21	EB2131497037	FOT08-1.5	Fuel Oil Tanks	Soil	Standard	-	**0.0295**	**0.0459**	**0.297**	**0.0056**	**0.0583**	<0.0010	**0.355**	<0.005	**0.0061**	**0.0061**	**0.0069**	**0.0083**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.5070**	-	-
13-Oct-21	EB2131497038	FOT08-1.9	Fuel Oil Tanks	Soil	Standard	-	**0.0522**	**0.13**	**0.757**	**0.0082**	**0.079**	<0.0024	**0.836**	<0.012	**0.0101**	**0.1380**	**0.02**	**0.0157**	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0061	<0.0024	<0.0061	<0.0061	<0.0061	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	**1.2100**	-	-
13-Oct-21	EB2129960068	FOT09-0.0	Fuel Oil Tanks	Soil	Standard	-	<0.0002	<0.0002	**0.0011**	<0.0002	**0.0132**	<0.0002	**0.0143**	<0.001	**0.0009**	**0.0006**	**0.0012**	**0.0013**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0187**	-	-
13-Oct-21	EB2131497039	FOT09-0.0	Fuel Oil Tanks	Soil	TOPA	<0.10	<0.0002	<0.0002	**0.0009**	<0.0002	**0.0143**	**0.0005**	**0.0152**	<0.001	**0.0012**	**0.0008**	**0.0012**	**0.0012**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0205**	**0.0200**	**0.0134**
13-Oct-21	EB2129940069	FOT09-0.5	Fuel Oil Tanks	Soil	Standard	-	<0.0002	<0.0002	**0.001**	<0.0002	**0.127**	<0.0002	**0.128**	**0.00**	**0.0051**	**0.0026**	**0.0004**	**0.0064**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1380**	-	-
13-Oct-21	EB2129940070	FOT09-1.0	Fuel Oil Tanks	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0394**	<0.0002	**0.0394**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0394**	-	-
13-Oct-21	EB2129941001	FOT09-1.6	Fuel Oil Tanks	Soil	Standard	-	<0.0002	**0.0007**	**0.0318**	**0.0012**	**0.0169**	<0.0002	**0.0487**	<0.001	**0.0002**	**0.0017**	**0.0002**	**0.0007**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0534**	-	-
13-Oct-21	EB2129941002	FOT10-0.0	Fuel Oil Tanks	Soil	Standard	-	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0092**	**0.0004**	**0.0096**	<0.001	**0.0019**	**0.0016**	**0.0004**	**0.0032**	**0.0002**	<0.

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T4: Soil Ash Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (mg/kg)	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg)											Perfluoroalkyl Sulfonamides (mg/kg)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg)				Total PFAS (mg/kg)		
							PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
PFAS NEMP Human Health - Residential with garden/accessible soil (HIL-A)						-	-	-	-	-	-	-	**0.01**	-	-	-	-	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Human Health - Industrial/Commercial (HIL-D)						-	-	-	-	-	-	-	**20**	-	-	-	-	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Interim Soil - Ecological Indirect Exposure						-	-	-	-	-	**0.01**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Interim Soil - Ecological Direct Exposure						-	-	-	-	-	**1.0**	-	-	-	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (mg/kg) - Standard Analysis						1	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0012	0.0005	0.0012	0.0012	0.0012	0.0012	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	-	-
Laboratory Level of Reporting (mg/kg) - TOPA						-	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002
12-Oct-21	EB2129938047	FTG16-0.8	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0037**	<0.0002	**0.0037**	<0.001	**0.0004**	**0.0006**	**0.0005**	**0.0002**	**0.0006**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.006**	-	-
12-Oct-21	EB2129938048	FTG17-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0002**	<0.0002	**0.012**	**0.0013**	**0.0122**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**	**0.0007**	**0.0004**	**0.0006**	**0.0002**	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0156**	-	-
12-Oct-21	EB2129938049	FTG17-0.5	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.01**	<0.0002	**0.01**	<0.001	**0.0003**	**0.0002**	**0.0003**	**0.0002**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0113**	-	-
12-Oct-21	EB2129938050	FTG17-1.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0116**	<0.0002	**0.0116**	<0.001	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.012**	-	-
13-Oct-21	EB2131497009	FTG17-1.3	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.011**	<0.0002	**0.011**	<0.001	**0.0003**	**0.0002**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0117**	-	-
13-Oct-21	EB2129938052	FTG18-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0062**	**0.0003**	**0.0067**	<0.001	**0.0002**	**0.0002**	**0.0002**	**0.0002**	**0.0004**	**0.0011**	**0.0004**	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0153**	-	-
13-Oct-21	EB2129938053	FTG18-0.4	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0006**	<0.0002	**0.0046**	**0.0004**	**0.0052**	<0.001	<0.0002	<0.0002	**0.0002**	**0.0003**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0063**	-	-
13-Oct-21	EB2129938054	FTG19-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0007**	**0.0002**	**0.0044**	<0.0002	**0.0051**	<0.001	**0.0009**	**0.0005**	**0.0007**	**0.001**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0087**	-	-
13-Oct-21	EB2131497010	FTG19-0.0	Fire Training Ground	Soil	TOPA	**0.11**	<0.0002	<0.0002	**0.0006**	<0.0002	**0.0037**	<0.0002	**0.0043**	<0.001	**0.0012**	**0.0007**	**0.0006**	**0.0009**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0079**	**0.0079**	**0.0052**
13-Oct-21	EB2129938055	FTG19-0.45	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0018**	<0.0002	**0.0054**	<0.0002	**0.0072**	<0.001	**0.0003**	**0.0004**	**0.0005**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0088**	-	-
13-Oct-21	EB2129938056	FTG19-1.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0028**	<0.0002	**0.003**	<0.001	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0033**	-	-
13-Oct-21	EB2129938057	FTG19-1.7	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.001**	<0.0002	**0.0025**	<0.0002	**0.0035**	<0.001	**0.0004**	**0.0005**	**0.0006**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0054**	-	-
13-Oct-21	EB2129938058	FTG20-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0006**	**0.0003**	**0.0329**	**0.0002**	**0.0335**	<0.001	**0.0005**	**0.0004**	**0.0006**	**0.0014**	**0.0022**	**0.0003**	**0.0004**	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0398**	-	-
13-Oct-21	EB2129938059	FTG20-0.8	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0002**	**0.0005**	**0.0152**	<0.0002	**0.0154**	<0.001	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0162**	-	-
13-Oct-21	EB2129938060	FTG21-0.0	Fire Training Ground	Soil	Standard	-	**0.0003**	**0.0012**	**0.0016**	**0.0013**	**0.0004**	<0.0002	**0.042**	<0.001	**0.0008**	**0.0036**	**0.0016**	**0.0175**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	**0.0024**	<0.0005	<0.0005	<0.0005	**0.0707**	-	-
13-Oct-21	EB2131497011	FTG21-0.0	Fire Training Ground	Soil	TOPA	**0.11**	**0.0003**	**0.0008**	**0.0323**	**0.0007**	**0.0064**	<0.0002	**0.0327**	<0.001	**0.002**	**0.0047**	**0.0017**	**0.0125**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0554**	**0.0554**	**0.0354**
13-Oct-21	EB2129938061	FTG21-0.5	Fire Training Ground	Soil	Standard	-	**0.0113**	**0.014**	**0.0389**	**0.0003**	**0.0044**	<0.0002	**0.0433**	**0.001**	**0.0069**	**0.0041**	**0.0068**	**0.0029**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.148**	-	-
13-Oct-21	EB2131497012	FTG21-0.5	Fire Training Ground	Soil	TOPA	**0.14**	**0.0116**	**0.0104**	**0.0333**	<0.0003	**0.0055**	<0.0003	**0.0388**	<0.001	**0.0085**	**0.0017**	**0.0067**	**0.0026**	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0006	<0.0003	<0.0006	<0.0006	<0.0006	<0.0006	<0.0003	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	**0.1400**	**0.1400**	**0.0898**
13-Oct-21	EB2129938062	FTG21-1.0	Fire Training Ground	Soil	Standard	-	**0.0005**	**0.0011**	**0.0075**	**0.0007**	**0.0509**	<0.0002	**0.0584**	<0.001	**0.0003**	**0.003**	**0.0005**	**0.0014**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0659**		
13-Oct-21	EB2131497013	FTG21-1.0	Fire Training Ground	Soil	TOPA	**0.1**	**0.0006**	**0.0008**	**0.0066**	**0.0005**	**0.0529**	<0.0003	**0.0595**	<0.001	**0.0006**	**0.0046**	**0.0007**	**0.0014**	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0007	<0.0003	<0.0007	<0.0007	<0.0007	<0.0007	<0.0003	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	**0.0689**	**0.0689**	**0.0444**
13-Oct-21	EB2129938063	FTG22-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0101**	<0.0002	**0.0104**	<0.001	**0.0006**	**0.0004**	**0.0003**	**0.0008**	**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.013**	-	-
13-Oct-21	EB2129938064	FTG22-0.8	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0261**	<0.0002	**0.0266**	<0.001	**0.001**	**0.0017**	**0.0009**	**0.0094**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0306**	-	-
13-Oct-21	EB2129938065	FTG23-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.002**	<0.0002	**0.002**	<0.001	**0.0002**	<0.0002	**0.0002**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.003**	-	-
13-Oct-21	EB2129938066	FTG23-0.8	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0013**	<0.0002	**0.0013**	<0.001	<0.0002	**0.0003**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0022**	-	-
13-Oct-21	EB2129938067	FTG24-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0002**	-	-
13-Oct-21	EB2129938068	FTG24-0.3	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	**0.0003**	<0.001	**0.0012**	**0.0017**	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.004**	-	-
13-Oct-21	EB2129938069	FTG25-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0062**	<0.0002	**0.0064**	<0.001	**0.0006**	**0.0004**	**0.0004**	**0.0004**	**0.0006**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0086**	-	-
13-Oct-21	EB2129938070	FTG25-0.8	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0029**	<0.0002	<0.0002	<0.0002	**0.0029**	<0.001	**0.0006**	**0.0008**	**0.0005**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0052**	-	-
13-Oct-21	EB2129938071	FTG26-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0018**	<0.0002	**0.0018**	<0.001	**0.0005**	**0.0003**	**0.0004**	**0.0006**	**0.0015**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0053**	-	-
13-Oct-21	EB2129938072	FTG26-0.5	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0003**	<0.001	<0.0002	<0.0002	<0.0002	**0.0004**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0009**	-	-
13-Oct-21	EB2129938073	FTG27-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0004	<0.001	**0.0004**	**0.0007**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.002**	-	-
13-Oct-21	EB2131497014	FTG27-0.3	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002	**0.0004**	<0.001	**0.0008**	**0.0005**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0019**	-	-
13-Oct-21	EB2129938075	FTG28-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0005**	<0.0002	**0.0008**	<0.001	**0.0014**	**0.0015**	**0.0016**	**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0058**	-	-
13-Oct-21	EB2129938076	FTG28-0.5	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.001**	<0.0002	**0.0004**	<0.0002	**0.0014**	<0.001	**0.0007**	**0.0014**	**0.0004**	**0.0054**	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0096**	-	-
13-Oct-21	EB2131497015	FTG28-1.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
13-Oct-21	EB2129938078	FTG29-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0129**	<0.0002	**0.0129**	<0.001	<0.0002	<0.0002	**0.0004**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0136**	-	-
13-Oct-21	EB2129938079	FTG29-0.3	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0029**	<0.0002	**0.0029**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0029**	-	-
13-Oct-21	EB2129938080	FTG30-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0065**	<0.0002	**0.0068**	<0.001	**0.0003**	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0072**	-	-
13-Oct-21	EB2129938082	FTG31-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0027**	<0.0002	**0.0027**	<0.001	**0.0005**	**0.0003**	**0.0002**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	**0.0019**	<0.0005	<0.0005	<0.0005	**0.0059**	-	-
13-Oct-21	EB2129938084	FTG32-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0002**	-	-
13-Oct-21	EB2129938085	FTG32-0.5	Fire Training Ground	Soil	Standard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-Oct-21	EB2131497016	FTG32-0.5	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	**0.0002**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0005**	-	-
13-Oct-21	EB2129938086	FTG33-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
13-Oct-21	EB2129938088	FTG33-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0023**	<0.0002	**0.0023**	<0.001	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0025**	-	-
13-Oct-21	EB2131497017	FTG34-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
13-Oct-21	EB2129938094	FTG35-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0038**	<0.0002	**0.0042**	<0.001	**0.0005**	**0.0006**	**0.0003**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0059**	-	-
13-Oct-21	EB2129938095	FTG35-0.5	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.005**	<0.0002	**0.005**	<0.001	**0.0002**	**0.0002**	**0.0002**	**0.0006**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0062**	-	-
13-Oct-21	EB2129938098	FTG36-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0006**	<0.0002	**0.0298**	<0.0002	**0.0304**	<0.001	**0.0011**	**0.0016**	**0.0013**	**0.002**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0367**	-	-
13-Oct-21	EB2129940001	FTG36-0.5	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0064**	<0.0002	**0.0067**	<0.001	**0.0002**	**0.0002**	**0.0002**	**0.0003**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0077**	-	-
13-Oct-21	EB2131497018	FTG36-2.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0072**	<0.0002	**0.0072**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0073**	-	-
13-Oct-21	EB2129940004	FTG37-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0058**	<0.0002	**0.0063**	<0.001	**0.0008**	**0.0012**	**0.001**	**0.0009**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0102**	-	-
13-Oct-21	EB2129940005	FTG37-0.5	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0011**	<0.0002	**0.0016**	<0.001	**0.0004**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0024**	-	-
13-Oct-21	EB2129940006	FTG37-1.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0004**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0004**	-	-
13-Oct-21	EB2129940007	FTG37-2.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0002**	<0.0002	**0.0004**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0004**	-	-
13-Oct-21	EB2129940008	FTG38-0.0	Fire Training Ground	Soil	Standard	-	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0005**	<0.0002	**0.0010**	<0.001	**0.0015**	**0.00**	**0.0023**	**0.0017**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0078**	-	-
13-Oct-21	EB2129940009	FTG38-0.5	Fire

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T4: Soil Ash Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (mg/kg)	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg)												Perfluoroalkyl Sulfonamides (mg/kg)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg)				Total PFAS (mg/kg)		
							PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
PFAS NEMP Human Health - Residential with garden/accessible soil (HIL-A)						-	-	-	-	-	-	-	**0.01**	-	-	-	-	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Human Health - Industrial/Commercial (HIL-D)						-	-	-	-	-	-	-	**20**	-	-	-	-	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Interim Soil - Ecological Indirect Exposure						-	-	-	-	-	**0.01**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Interim Soil - Ecological Direct Exposure						-	-	-	-	-	**1.0**	-	-	-	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (mg/kg) - Standard Analysis						1	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0012	0.0005	0.0012	0.0012	0.0012	0.0012	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	-	-
Laboratory Level of Reporting (mg/kg) - TOPA						-	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002
30-Jun-22	EB2219206026	EPA01-4.5	Evaporation Ponds A - North	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
30-Jun-22	EB2219206029	EPA01-6.0	Evaporation Ponds A - North	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
30-Jun-22	EB2219206031	EPA01-7.0	Evaporation Ponds A - North	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
30-Jun-22	EB2219206033	EPA01-8.0	Evaporation Ponds A - North	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
30-Jun-22	EB2219206036	EPA01-9.5	Evaporation Ponds A - North	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
30-Jun-22	EB2219206037	EPA02-0.0	Evaporation Ponds A - Central	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
30-Jun-22	EB2219206039	EPA02-0.5	Evaporation Ponds A - Central	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
30-Jun-22	EB2219206041	EPA02-1.5	Evaporation Ponds A - Central	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
30-Jun-22	EB2219206044	EPA02-2.5	Evaporation Ponds A - Central	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
30-Jun-22	EB2219206055	EPA02-8.0	Evaporation Ponds A - Central	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
29-Jun-22	EB2219206059	EPA03-0.0	Evaporation Ponds A - Southern	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
29-Jun-22	EB2219206061	EPA03-0.5	Evaporation Ponds A - Southern	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
29-Jun-22	EB2219206066	EPA03-3.0	Evaporation Ponds A - Southern	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
29-Jun-22	EB2219206068	EPA03-4.0	Evaporation Ponds A - Southern	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002		
BS3																																						
21-Oct-21	EB2130787011	BS3_1-0.3-0.4	BS3 Capping	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
21-Oct-21	EB2130787012	BS3_1-0.2-0.3	BS3 Capping	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
21-Oct-21	EB2130787013	BS3_1-0.0-0.1	BS3 Capping	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
21-Oct-21	EB2130787014	BS3_2-0.0-0.1	BS3 Capping	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
21-Oct-21	EB2130787015	BS3_2-0.2-0.3	BS3 Capping	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
21-Oct-21	EB2130787016	BS3_2-0.5-0.6	BS3 Capping	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
21-Oct-21	EB2130787017	BS3_3-0.0-0.1	BS3 Capping	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
21-Oct-21	EB2130787018	BS3_3-0.3-0.4	BS3 Capping	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
21-Oct-21	EB2130787019	BS3_3-0.5-0.6	BS3 Capping	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
Fire Station																																						
30-Jun-22	EB2219206071	FS01-0.0	Fire Station (Front)	Soil	Standard	-	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0039**	<0.0002	**0.0043**	<0.001	**0.0007**	**0.0009**	**0.0007**	**0.001**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	**0.0167**	**0.0068**	<0.0005	**0.0251**		
30-Jun-22	EB2219206072	FS01-0.2	Fire Station (Front)	Soil	Standard	-	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0034**	<0.0002	**0.0038**	<0.001	**0.0013**	**0.0017**	**0.0011**	**0.0046**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	**0.0044**	<0.0005	<0.0005	**0.0127**		
30-Jun-22	EB2219206077	FS02-0.0	Fire Station (Side)	Soil	Standard	-	**0.0003**	<0.0002	**0.0008**	<0.0002	**0.0077**	<0.0002	**0.0085**	**0.00**	**0.0025**	**0.0014**	**0.001**	**0.0009**	**0.0016**	**0.0004**	**0.0002**	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0188**		
30-Jun-22	EB2219206078	FS02-0.2	Fire Station (Side)	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	**0.0011**	<0.0002	**0.0011**	<0.001	**0.0002**	<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0015**		
Callide A																																						
29-Jun-22	EB2219210001	AD1-1.0-0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210002	AD1-1.0-5	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210003	AD1-1.1-0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210004	AD1-1.1-5	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210005	AD1-1.2-0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210006	AD1-1.2-5	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210007	AD1-1.2-9	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210008	AD1-2-0.0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210009	AD1-2-1.0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210010	AD1-2-1.5	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210011	AD1-2-2.0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210012	AD1-2-2.5	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210013	AD1-2-2.8	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210014	AD1-3-0.0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210015	AD1-3-0.5	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210016	AD1-2-4.0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210017	AD1-2-4.5	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210018	AD1-2-5.0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210019	AD1-2-5.5	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210020	AD1-2-6.0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210021	AD1-2-6.5	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210022	AD1-2-7.0	Ash Dam 1	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210023	AD2-1-0.0	Ash Dam 2	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210024	AD2-1-0.5	Ash Dam 2	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210025	AD2-1-0.8	Ash Dam 2	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	<0.001	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	EB2219210026	AD2-1-0.8	Ash Dam 2	Ash	Standard	-	<0.0002	<0.0002	<

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Event: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T6: Soil, Sediment and Ash Leachate Results

Sample Date	Laboratory Sample Number	Sample Duplicate	Sample Number	Material Type	Analysis	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)							Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)												Perfluoroalkyl Sulfonamides (µg/L)							Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)
						PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)						-	-	-	-	**0.00023**	-	-	-	-	-	-	**19**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)						-	-	-	-	**0.13**	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water						-	-	**0.07**	-	**0.07**	-	**0.07**	-	-	-	-	**0.56**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water						-	-	**0.7**	-	**0.7**	-	**0.7**	-	-	-	-	**5.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L)) - Standard Analysis						0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005
Laboratory Level of Reporting (µg/L)) - TOPA						0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.002
Fuel Oil Tanks (FOT)																																		
03-Nov-20	EB2030235033	-	BH1-0.1-0.2	Soil	Leachate (ASLP)	<0.0790	<0.0790	**0.205**	<0.0790	**24.9**	<0.0790	**25.1**	<0.0800	<0.111	<0.0790	<0.0790	<0.0790	<0.0790	<0.0790	<0.0790	<0.0790	<0.0790	<0.197	<0.0790	<0.197	<0.197	<0.197	<0.197	<0.0790	<0.0790	<0.079	<0.079	<0.079	<0.079	**25.1**
03-Nov-20	EB2030235035	-	BH2-0.0-0.1	Soil	Leachate (ASLP)	<0.0016	<0.0016	**0.0214**	**0.0018**	**0.333**	**0.046**	**0.354**	<0.0020	<0.0025	**0.009**	**0.0022**	**0.0054**	**0.0018**	**0.0021**	**0.0032**	**0.0053**	<0.0016	<0.0040	**0.0027**	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.371**
03-Nov-20	EB2030235039	-	BH3-0.0-0.1	Soil	Leachate (ASLP)	<0.0157	<0.0157	**0.294**	**0.0457**	**11.8**	**0.4**	**12.1**	<0.0260	<0.0157	**0.052**	**0.0252**	**0.121**	<0.0157	<0.0157	<0.0157	<0.0157	<0.0157	<0.0394	**0.0189**	<0.039	<0.039	<0.039	<0.039	<0.0157	<0.0157	<0.016	<0.016	<0.016	<0.016	**12.3**
03-Nov-20	EB2030235043	-	BH4-0.0-0.1	Soil	Leachate (ASLP)	<0.0157	<0.0157	**0.0268**	<0.0157	**2.34**	<0.0157	**2.37**	<0.0157	<0.0175	<0.0157	<0.0157	**0.0157**	<0.0157	<0.0157	<0.0157	<0.0157	<0.0157	<0.0394	<0.0157	<0.039	<0.039	<0.039	<0.039	<0.0157	<0.0157	<0.016	<0.016	<0.016	<0.016	**2.38**
13-Oct-21	EB2131497078	-	FOT04-0.0	Soil	Leachate (ASLP)	**0.0778**	**0.0286**	**0.214**	**0.0206**	**3.35**	<0.0159	**3.56**	**0.20**	**0.1**	**0.0667**	<0.0159	**0.0254**	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0397	<0.0159	<0.040	<0.040	<0.040	<0.040	<0.0159	<0.0159	<0.016	<0.016	<0.016	<0.016	**4.09**
13-Oct-21	EB2131497024	-	FOT04-0.0	Soil	Leachate (TCLP)	**0.0554**	**0.0272**	**0.21**	**0.039**	**2.54**	<0.0032	**2.75**	**0.21**	**0.0778**	**0.0909**	**0.009**	**0.0298**	<0.0065	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**3.29**
13-Oct-21	EB2131497079	-	FOT06-0.0	Soil	Leachate (ASLP)	<0.0080	<0.0080	**0.047**	<0.0080	**1.79**	<0.0080	**1.84**	**0.09**	**0.101**	**0.059**	**0.0183**	**0.0183**	**0.0135**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0199	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	<0.008	<0.008	<0.008	**2.14**
13-Oct-21	EB2131497028	-	FOT06-0.0	Soil	Leachate (TCLP)	**0.0052**	**0.0049**	**0.0465**	**0.0053**	**0.92**	<0.0016	**0.966**	**0.13**	**0.122**	**0.0777**	**0.0234**	**0.0292**	**0.0069**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**1.38**
13-Oct-21	EB2131497080	-	FOT07-0.0	Soil	Leachate (ASLP)	<0.160	<0.160	**0.512**	<0.160	**14.2**	<0.160	**14.7**	<0.800	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	<0.400	<0.160	<0.400	<0.400	<0.400	<0.400	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	**14.7**
13-Oct-21	EB2131497030	-	FOT07-0.0	Soil	Leachate (TCLP)	**0.0320**	**0.0176**	**0.434**	**0.112**	**6.88**	<0.0160	**7.31**	<0.0800	**0.0768**	**0.0608**	<0.0160	**0.104**	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0400	<0.0160	<0.040	<0.040	<0.040	<0.040	<0.0160	<0.0160	<0.016	<0.016	<0.016	<0.016	**7.72**
13-Oct-21	EB2131497081	-	FOT07-0.5	Soil	Leachate (TCLP)	**1.6200**	**1.17**	**8.4**	**0.528**	**37.8**	<0.160	**46.2**	<0.800	**1.33**	**3.17**	<0.160	**0.432**	<0.160	<0.160	<0.160	<0.160	<0.160	<0.400	<0.160	<0.400	<0.400	<0.400	<0.400	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	**54.4**
13-Oct-21	EB2131497031	-	FOT07-0.5	Soil	Leachate (ASLP)	**1.0200**	**0.656**	**4.95**	**0.296**	**16.7**	<0.0800	**21.6**	<0.400	**0.832**	**2.01**	**0.088**	**0.184**	<0.0800	<0.0800	<0.0800	<0.0800	<0.0800	<0.200	<0.0800	<0.200	<0.200	<0.200	<0.200	<0.0800	<0.0800	<0.080	<0.080	<0.080	<0.080	**26.7**
13-Oct-21	EB2131497082	-	FOT08-0.5	Soil	Leachate (ASLP)	**1.5400**	**1.06**	**15.8**	**0.992**	**54.1**	<0.320	**69.9**	<1.60	**1.06**	**3.46**	<0.320	**0.864**	<0.320	<0.320	<0.320	<0.320	<0.320	<0.800	<0.320	<0.800	<0.800	<0.800	<0.800	<0.320	<0.320	<0.320	<0.320	<0.320	<0.320	**78.9**
13-Oct-21	EB2131497035	-	FOT08-0.5	Soil	Leachate (TCLP)	**1.1500**	**0.896**	**13.3**	**1.04**	**36.6**	<0.0800	**49.9**	<0.400	**0.792**	**2.59**	**0.144**	**0.608**	<0.0800	<0.0800	<0.0800	<0.0800	<0.0800	<0.200	<0.0800	<0.200	<0.200	<0.200	<0.200	<0.0800	<0.0800	<0.080	<0.080	<0.080	<0.080	**57.1**
14-Oct-21	EB2131497083	-	FOT09-0.0	Soil	Leachate (ASLP)	<0.0032	<0.0032	**0.0252**	<0.0032	**0.535**	<0.0032	**0.56**	<0.0159	**0.0303**	**0.0182**	**0.0549**	**0.0351**	**0.0076**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	**0.006**	<0.003	**0.712**
13-Oct-21	EB2131497039	-	FOT09-0.0	Soil	Leachate (TCLP)	**0.0016**	**0.0042**	**0.0361**	**0.0016**	**0.296**	<0.0008	**0.332**	**0.03**	**0.0477**	**0.0257**	**0.0517**	**0.0528**	**0.0113**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.002**	**0.003**	<0.001	**0.565**
14-Oct-21	EB2131497084	-	FOT13-0.0	Soil	Leachate (ASLP)	<0.0319	<0.0319	**0.0511**	<0.0319	**5.55**	<0.0319	**5.6**	<0.160	<0.0319	<0.0319	<0.0319	**0.0415**	<0.0319	<0.0319	<0.0319	<0.0319	<0.0319	<0.0798	<0.0319	<0.080	<0.080	<0.080	<0.080	<0.0319	<0.0319	<0.032	<0.032	<0.032	<0.032	**5.64**
14-Oct-21	EB2131497040	-	FOT13-0.5	Soil	Leachate (ASLP)	<0.0032	<0.0032	**0.0332**	**0.0156**	**2.88**	<0.0032	**2.91**	<0.0160	**0.0118**	**0.0128**	**0.0038**	**0.0284**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**2.98**
14-Oct-21	EB2131497085	-	FOT15-0.5	Soil	Leachate (ASLP)	<0.0159	<0.0159	**0.027**	<0.0159	**2.29**	<0.0159	**2.32**	<0.0794	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0397	<0.0159	<0.040	<0.040	<0.040	<0.040	<0.0159	<0.0159	<0.016	<0.016	<0.016	<0.016	**2.32**
14-Oct-21	EB2131497044	-	FOT15-0.5	Soil	Leachate (TCLP)	<0.0032	<0.0032	**0.023**	**0.0042**	**1.27**	<0.0032	**1.29**	<0.0160	<0.0032	**0.0045**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**1.3**
13-Oct-21	EB2131497086	-	FOT18-0.1	Soil	Leachate (ASLP)	<0.800	<0.800	**16.2**	**0.88**	**10.4**	<0.800	**26.6**	<4.00	**1.6**	**4.56**	**1.68**	**10.2**	<0.800	<0.800	<0.800	<0.800	<0.800	<2.00	<0.800	<2.00	<2.00	<2.00	<2.00	<0.800	<0.800	<0.800	**132**	**6.56**	<0.800	**184**
14-Oct-21	EB2131497046	-	FOT18-0.1	Soil	Leachate (TCLP)	<0.800	<0.800	**17.7**	**0.88**	**7.92**	<0.800	**25.6**	<4.00	**1.52**	**4.72**	**1.84**	**10.7**	<0.800	<0.800	<0.800	<0.800	<0.800	<2.00	<0.800	<2.00	<2.00	<2.00	<2.00	<0.800	<0.800	<0.800	**155**	**3.52**	<0.800	**204**
14-Oct-21	EB2131497087	-	FOT18-0.6	Soil	Leachate (ASLP)	<0.161	<0.161	**1.27**	**0.242**	**19.8**	<0.161	**21.1**	<0.805	**0.258**	**0.515**	<0.161	**1.32**	**0.225**	<0.161	<0.161	<0.161	<0.161	<0.402	<0.161	<0.402	<0.402	<0.402	<0.402	<0.161	<0.161	<0.161	**13.5**	**35.3**	<0.161	**72.4**
14-Oct-21	EB2131497047	-	FOT18-0.6	Soil	Leachate (TCLP)	**0.0329**	**0.0603**	**1.19**	**0.251**	**11.6**	<0.0565	**12.8**	<0.0685	**0.194**	**0.468**	**0.17**	**1.18**	**0.225**	**0.119**	<0.0137	<0.0137	<0.0137	<0.0342	**0.0534**	<0.034	<0.034	<0.034	<0.034	<0.0137	<0.0137	<0.014	**12.2**	**23.3**	<0.014	**51**
14-Oct-21	EB2131497088	-	FOT19-0.0	Soil	Leachate (ASLP)	**0.0303**	**0.0191**	**0.222**	**0.0199**	**0.996**	<0.0080	**1.22**	<0.0398	**0.0143**	**0.0406**	**0.0096**	**0.0486**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0199	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	**0.022**	<0.008	<0.008	**1.42**
14-Oct-21	EB2131497048	-	FOT19-0.0	Soil	Leachate (TCLP)	**0.0199**	**0.0152**	**0.154**	**0.0169**	**0.599**	<0.0016	**0.753**	**0.02**	**0.0106**	**0.0316**	**0.0093**	**0.035**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.018**	**0.002**	<0.002	**0.928**
14-Oct-21	EB2131497089	-	FOT19-0.3	Soil	Leachate (ASLP)	**0.0104**	**0.0136**	**0.227**	**0.024**	**1.1**	<0.0080	**1.33**	<0.0400	**0.0104**	**0.0328**	<0.0080	**0.036**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0200	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	**0.045**	**0.024**	<0.008	**1.52**
14-Oct-21	EB2131497049	-	FOT19-0.3	Soil	Leachate (TCLP)	**0.0068**	**0.0123**	**0.191**	**0.0222**	**0.753**	<0.0016	**0.944**	<0.0079	**0.0072**	**0.0282**	**0.0077**	**0.0297**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.038**	**0.006**	<0.002	**1.1**
14-Oct-21	EB2131497050	-	FOT20-0.5	Soil	Leachate (ASLP)	**0.0182**	**0.0226**	**0.221**	**0.0035**	**0.0794**	<0.0032	**0.3**	<0.0159	**0.0064**	**0.0775**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.439**
14-Oct-21	EB2131497051	-	FOT20-0.5	Soil	Leachate (TCLP)	**0.0122**	**0.0207**	**0.198**	**0.0036**	**0.0453**	<0.0008	**0.243**	**0.01**	**0.0081**	**0.0831**	**0.0012**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.002**	<0.001	<0.001	**0.382**
14-Oct-21	EB2131497091	-	FOT26-0.0	Soil	Leachate (ASLP)	<0.0032	<0.0032	**0.0035**	<0.0032	**0.0322**	<0.0032	**0.0357**	<0.0159	<0.0032	**0.0038**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0395**
14-Oct-21	EB2131497054	-	FOT26-0.0	Soil	Leachate (TCLP)	<0.0032	<0.0032	<0.0032	<0.0032	**0.0233**	<0.0032	**0.0233**	<0.0160	**0.0032**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0265**
Fire Training Ground (FTG)																																		
04-Nov-20	EB2030235058	-	FTG-SED1	Soil	Leachate (ASLP)	<0.0156	<0.0156	**0.353**	**0.0469**	**2.37**	<0.0156	**2.72**	<0.102	**0.152**	**0.131**	**0.122**	**0.747**	**0.322**	**0.0938**	**0.0203**	<0.0156	<0.0156	<0.0391	<0.0156	<0.039	<0.039	<0.039	<0.039	<0.0156	<0.0156	<0.016	**3.26**	**2.09**	**0.116**	**9.22**
04-Nov-20	EB2030235059	-	FTG-SED2	Soil	Leachate (ASLP)	<0.0156	<0.0156	**0.283**	**0.0578**	**4.25**	**0.0578**	**4.53**	<0.116	**0.298**	**0.192**	**0.169**	**0.852**	**0.478**	**0.167**	**0.106**	**0.0812**	**0.0266**	<0.0391	<0.0156	<0.039	<0.039	<0.039	<0.039	<0.0156	<0.0156	<0.016	**4.15**	**9.8**	**0.848**	**20**
12-Oct-21	EB2131497066	-	FTG04-0.0	Soil	Leachate (ASLP)	<0.0032	<0.0032	**0.0115**	<0.0032	**0.44**	<0.0032	**0.452**	**0.05**	**0.0588**	**0.0259**	**0.0297**	**0.0527**	**0.123**	**0.0252**	**0.0054**	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.01**	**0.019**	<0.004	**0.852**
12-Oct-21	EB2131497001	-	FTG04-0.0	Soil	Leachate (ASLP)	<0.0016	<0.0016	**0.009**	**0.0019**	**0.225**	<0.0016	**0.234**	**0.06**	**0.079**	**0.0338**	**0.0323**	**0.0491**	**0.0992**	**0.012**	<0.0018	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.013**	**0.009**	<0.002	**0.624**
12-Oct-21	EB2131497067	-	FTG08-0.0	Soil	Leachate (ASLP)	<0.0159	<0.0159	**0.0317**	<0.0159	**1.23**	<0.0159	**1.26**	<0.0794	**0.0698**	**0.0413**	**0.0698**	**0.154**	**0.152**	**0.103**	**0.0254**	<0.0159	<0.0159	<0.0397	<0.0159	<0.040	<0.040	<0.040	<0.040	<0.0159	<0.0159	<0.016	**0.156**	**1.48**	**0.03**	**3.54**
12-Oct-21	EB2131497002	-	FTG08-0.4	Soil	Leachate (ASLP)	**0.0020**	**0.0032**	**0.0318**	**0.0095**	**0.825**	**0.0137**	**0.857**	**0.03**	**0.0664**	**0.0431**	**0.0624**	**0.131**	**0.135**	**0.0644**	<0.0110	**0.001**	<0.0008	<0.0020	**0.0015**	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.153**	**0.859**	**0.003**	**2.44**
12-Oct-21	EB2131497068	-	FTG08-0.4	Soil	Leachate (ASLP)	<0.0080	<0.0080	**0.0143**	<0.0080	**0.492**	<0.0080	**0.506**	<0.0398	**0.0398**	**0.0215**	**0.0406**	**0.0876**	**0.0805**	**0.0422**	**0.0112**	<0.0080	<0.0080	<0.0199	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	**0.113**	**1.03**	<0.009	**1.97**
12-Oct-21	EB2131497003	-	FTG08-0.4	Soil	Leachate (TCLP)	**0.0006**	**0.001**	**0.0115**	**0.0061**	**0.517**	**0.0426**	**0.528**	**0.01**	**0.0404**	**0.0192**	**0.0367**	**0.0811**	**0.0774**	**0.0362**	<0.0079	**0.0008**	<0.0005	<0.0025	**0.0014**	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.113**	**0.767**	<0.002	**1.76**
12-Oct-21	EB2129941088	-	Concrete Core 10	Concrete	Leachate (ASLP)	**0.8730**	**0.712**	**2.87**	**0.218**	**4.5**	<0.0299	**7.37**	**0.64**	**0.879**	**3.53**	**0.598**	**0.858**	<0.0299	<0.0299	<0.0299	<0.0299	<0.0299	<0.0748	**0.0299**	<0.075	<0.075	<0.075	<0.075	<0.0299	<0.0299	<0.030	**2.75**	**0.299**	<0.030	**18.8**
12-Oct-21	EB2131497069	-	FTG10-0.3	Soil	Leachate (ASLP)	**0.1620**	**0.102**	**0.549**	**0.0368**	**1.53**	<0.0160	**2.08**	**0.08**	**0.192**	**0.544**	**0.0912**	**0.155**	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0400	<0.0160	<0.040	<0.040	<0.040	<0.040	<0.0160	<0.0160	<0.016	**0.245**	**0.032**	<0.016	**3.72**
12-Oct-21	EB2131497004	-	FTG10-0.3	Soil	Leachate (TCLP)	**0.1700**	**0.11**	**0.607**	**0.0626**	**1.52**	<0.0032	**2.13**	**0.12**	**0.203**	**0.607**	**0.0965**	**0.178**	<0.0052	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.307**	**0.015**	<0.003	**3.99**
12-Oct-21	EB2129941089	-	Concrete Core 11	Concrete	Leachate (ASLP)	**1.9800**	**0.777**	**1.11**	**0.0168**	**0.113**	<0.0153	**1.22**	**1.01**	**1.44**	**7.14**	**0.878**	**0.475**	**0.0214**	<0.0153	<0.0153	<0.0153	<0.0153	<0.0382	<0.0153	<0.038	<0.038	<0.038	<0.038	<0.038	<0.0153	<0.0153	**0.0380**	**5.29**	**0.504**	<0.015	**20.8**
12-Oct-21	EB2129941090	-	Concrete Core 12	Concrete	Leachate (ASLP)	**0.0937**	**0.0167**	**0.0264**	**0.0014**	**0.0245**	<0.0005	**0.0509**	**0.07**	**0.0988**	**0.613**	**0.0985**	**0.0132**	**0.0015**	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.0020**	**0.171**	**0.031**	<0.001	**1.26**
12-Oct-21	EB2131497070	-	FTG12-0.2	Soil	Leachate (ASLP)	**0.0316**	**0.0118**	**0.0617**	<0.0032	**0.0505**	<0.0032	**0.112**	**0.02**	**0.0869**	**0.0885**	**0.0156**	**0.0179**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	**0.044**	<0.004	**0.428**
12-Oct-21	EB2131497006	-	FTG12-0.2	Soil	Leachate (TCLP)	**0.0157**	**0.0074**	**0.0522**	**0.0047**	**0.0673**	<0.0005	**0.12**	**0.01**	**0.0425**	**0.0509**	**0.0125**	**0.0187**	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0015	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.07**	**0.003**	<0.001	**0.359**
12-Oct-21	EB2131497071	-	FTG13-0.0	Soil	Leachate (ASLP)	<0.0032	<0.0032	**0.0093**	<0.0032	**0.168**	<0.0032	**0.177**	**0.03**	**0.0317**	**0.0154**	**0.0131**	**0.0234**	**0.0445**	**0.0211**	**0.0038**	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.013**	**0.007**	**0.007**	**0.408**
12-Oct-21	EB2131497008	-	FTG13-0.0	Soil	Leachate (TCLP)	<0.0008	<0.0008	**0.0094**	**0.0015**	**0.167**	<0.0012	**0.176**	**0.02**	**0.0255**	**0.0154**	**0.0171**	**0.029**	**0.0645**	**0.0197**	<0.0020	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.014**	**0.025**	<0.001	**0.41**
12-Oct-21	EB2131497072	-	FTG19-0.0	Soil	Leachate (ASLP)	**0.0054**	<0.0032	**0.0319**	**0.0083**	**0.2**	<0.0032	**0.232**	**0.02**	**0.0501**	**0.0265**	**0.0303**	**0.0469**	**0.0115**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.431**
13-Oct-21	EB2131497010	-	FTG19-0.0	Soil	Leachate (TCLP)	**0.0048**	**0.0027**	**0.0254**	**0.0078**	**0.132**	<0.0005	**0.157**	**0.02**	**0.0392**	**0.0245**	**0.027**	**0.0379**	<0.0069	<0.0005	<0.0005	<0.0005	<0.0005	<0.0008	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.003**	<0.001	<0.001	**0.327**
13-Oct-21	EB2131497073	-	FTG21-0.0	Soil	Leachate (ASLP)	**0.0157**	**0.0634**	**1.8**	**0.04**	**0.0202**	<0.0032	**1.82**	<0.0160	**0.0579**	**0.185**	**0.0999**	**0.66**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.097**	<0.003	<0.003	**3.03**
13-Oct-21	EB2131497011	-	FTG21-0.0	Soil	Leachate (TCLP)	**0.0125**	**0.0522**	**1.64**	**0.048**	**0.0166**	<0.0032	**1.66**	<0.0160	**0.0442**	**0.16**	**0.0784**	**0.73**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.119**	<0.003	<0.003	**2.9**
13-Oct-21	EB2131497074	-	FTG21-0.5	Soil	Leachate (ASLP)	**0.5550**	**0.676**	**1.74**	**0.0096**	**0.217**	<0.0080	**1.96**	**0.04**	**0.36**	**2.82**	**0.336**	**0.134**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0200	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	<0.008	<0.008	<0.008	**6.89**
13-Oct-21	EB2131497012	-	FTG21-0.5	Soil	Leachate (TCLP)	**0.5400**	**0.554**	**1.57**	**0.0102**	**0.138**	<0.0032	**1.71**	**0.05**	**0.362**	**2.88**	**0.3**	**0.118**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**6.52**
13-Oct-21	EB2131497075	-	FTG21-1.0	Soil	Leachate (ASLP)	**0.0206**	**0.0397**	**0.275**	**0.019**	**1.71**	<0.0159	**1.98**	<0.0794	**0.0175**	**0.121**	**0.0206**	**0.0492**	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0397	<0.0159	<0.040	<0.040	<0.040	<0.040	<0.0159	<0.0159	<0.016	<0.016	<0.016	<0.016	**2.27**
13-Oct-21	EB2131497013	-	FTG21-1.0	Soil	Leachate (TCLP)	**0.0184**	**0.0363**	**0.248**	**0.0299**	**1.48**	<0.0016	**1.73**	<0.0080	**0.0144**	**0.115**	**0.0193**	**0.0454**	<0.0044	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.004**	<0.002	<0.002	**2.01**
13-Oct-21	EB2131497076	-	FTG40-0.0	Soil	Leachate (ASLP)	<0.0032	<0.0032	<0.0032	<0.0032	**0.0096**	<0.0032	**0.0096**	<0.0160	**0.0051**	**0.0038**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0185**
13-Oct-21	EB2131497019	-	FTG40-0.0	Soil	Leachate (TCLP)	<0.0005	<0.0005	**0.002**	<0.0005	**0.0091**	<0.0005	**0.0111**	**0.01**	**0.0079**	**0.005**	**0.0048**	**0.0026**	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0008	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0393**
13-Oct-21	EB2131497020	-	FTG41-0.0	Soil	Leachate (TCLP)	**0.0121**	**0.0086**	**0.0517**	<0.0032	**0.153**	<0.0032	**0.205**	**0.02**	**0.0587**	**0.0555**	**0.0472**	**0.0252**	<0.0170	**0.0032**	<0.0032	<0.

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Event: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T7: Leachate Comparison

Sample Date	Laboratory Sample Number	Sample Location/Area	Sample Number	Material Type	Analysis	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg / µg/L)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg / µg/L)												Perfluoroalkyl Sulfonamides (mg/kg / µg/L)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg / µg/L)				Total PFAS (mg/kg / µg/L)
						PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)						-	-	-	-	**0.00023**	-	-	-	-	-	-	**19**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)						-	-	-	-	**0.13**	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water						-	-	**0.07**	-	**0.07**	-	**0.07**	-	-	-	-	**0.56**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water						**0.7**	-	**0.7**	-	**0.7**	-	**0.7**	-	-	-	-	**5.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L)) - Standard Analysis						0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005
Laboratory Level of Reporting (µg/L)) - TOPA						0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.002
03-Nov-20	EB2029263033	Fuel Oil Tanks	BH1-0.1-0.2	Soil	Standard	<0.0010	<0.0010	**0.0059**	**0.0013**	**0.563**	<0.0010	**0.572**	<0.005	**0.0014**	**0.0014**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.5730**
03-Nov-20	EB2030235033	Fuel Oil Tanks	BH1-0.1-0.2	Soil	Leachate (ASLP)	<0.0790	<0.0790	**0.205**	<0.0790	**24.9**	<0.0790	**25.1**	<0.0800	<0.111	<0.0790	<0.0790	<0.0790	<0.0790	<0.0790	<0.0790	<0.0790	<0.0790	<0.197	<0.0790	<0.197	<0.197	<0.197	<0.197	<0.0790	<0.0790	<0.079	<0.079	<0.079	<0.079	<0.079	**25.1**
Percent Leachable						-	-	69%	-	88%	-	88%	-	-	-	-	39%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88%
03-Nov-20	EB2029263035	Fuel Oil Tanks	BH2-0.0-0.1	Soil	Standard	**0.0009**	**0.0012**	**0.0114**	**0.0008**	**0.0415**	**0.0036**	**0.0561**	<0.002	**0.0006**	**0.0012**	<0.0005	**0.0005**	<0.0005	<0.0005	<0.0005	**0.0014**	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0631**
03-Nov-20	EB2030235035	Fuel Oil Tanks	BH2-0.0-0.1	Soil	Leachate (ASLP)	<0.0016	<0.0016	**0.0214**	**0.0018**	**0.333**	**0.046**	**0.354**	<0.0020	<0.0025	**0.009**	**0.0022**	**0.0054**	**0.0018**	**0.0021**	**0.0032**	**0.0053**	<0.0016	<0.0040	**0.0027**	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.002	**0.371**
Percent Leachable						-	-	4%	-	16%	26%	13%	-	-	15%	-	22%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12%
03-Nov-20	EB2029263039	Fuel Oil Tanks	BH3-0.0-0.1	Soil	Standard	<0.0010	<0.0010	**0.0065**	<0.0010	**0.228**	**0.0175**	**0.239**	<0.005	**0.0012**	<0.0010	<0.0010	**0.0029**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.2560**
03-Nov-20	EB2030235039	Fuel Oil Tanks	BH3-0.0-0.1	Soil	Leachate (ASLP)	<0.0157	<0.0157	**0.294**	**0.0457**	**11.8**	**0.4**	**12.1**	<0.0260	<0.0157	**0.052**	**0.0252**	**0.121**	<0.0157	<0.0157	<0.0157	<0.0157	<0.0157	<0.0394	**0.0189**	<0.039	<0.039	<0.039	<0.039	<0.0157	<0.0157	<0.016	<0.016	<0.016	<0.016	<0.016	**12.3**
Percent Leachable						-	-	90%	-	104%	46%	101%	-	-	-	-	83%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96%
03-Nov-20	EB2029263043	Fuel Oil Tanks	BH04-0.0-0.1	Soil	Standard	<0.0005	<0.0005	**0.001**	<0.0005	**0.0545**	<0.0005	**0.0586**	<0.002	**0.0008**	**0.0006**	**0.0009**	**0.0008**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0586**
03-Nov-20	EB2030235043	Fuel Oil Tanks	BH4-0.0-0.1	Soil	Leachate (ASLP)	<0.0157	<0.0157	**0.0268**	<0.0157	**2.34**	<0.0157	**2.37**	<0.0157	<0.0175	<0.0157	<0.0157	**0.0157**	<0.0157	<0.0157	<0.0157	<0.0157	<0.0157	<0.0394	<0.0157	<0.039	<0.039	<0.039	<0.039	<0.0157	<0.0157	<0.016	<0.016	<0.016	<0.016	<0.016	**2.38**
Percent Leachable						-	-	54%	-	86%	-	81%	-	-	-	-	38%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81%
13-Oct-21	EB2129940047	Fuel Oil Tanks	FOT04-0.0	Soil	Standard	**0.0016**	**0.0008**	**0.0072**	**0.0013**	**0.179**	**0.0044**	**0.186**	**0.01**	**0.0019**	**0.0015**	<0.0002	**0.0009**	**0.0004**	<0.0002	<0.0002	**0.0002**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.2040**
13-Oct-21	EB2131497078	Fuel Oil Tanks	FOT04-0.0	Soil	Leachate (ASLP)	**0.0778**	**0.0286**	**0.214**	**0.0206**	**3.35**	<0.0159	**3.56**	**0.20**	**0.1**	**0.0667**	<0.0159	**0.0254**	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0397	<0.0159	<0.040	<0.040	<0.040	<0.040	<0.0159	<0.0159	<0.016	<0.016	<0.016	<0.016	<0.016	**4.09**
Percent Leachable						97%	72%	59%	32%	37%	-	38%	81%	105%	89%	-	56%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40%
13-Oct-21	EB2129940047	Fuel Oil Tanks	FOT04-0.0	Soil	Standard	**0.0016**	**0.0008**	**0.0072**	**0.0013**	**0.179**	**0.0044**	**0.186**	**0.01**	**0.0019**	**0.0015**	<0.0002	**0.0009**	**0.0004**	<0.0002	<0.0002	**0.0002**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.2040**
13-Oct-21	EB2131497024	Fuel Oil Tanks	FOT04-0.0	Soil	Leachate (TCLP)	**0.0554**	**0.0272**	**0.21**	**0.039**	**2.84**	<0.0032	**2.75**	**0.21**	**0.0778**	**0.0909**	**0.009**	**0.0298**	<0.0065	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.003	**3.29**
Percent Leachable						69%	68%	58%	60%	28%	-	30%	84%	82%	121%	-	66%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32%
13-Oct-21	EB2129940054	Fuel Oil Tanks	FOT06-0.0	Soil	Standard	<0.0005	<0.0005	**0.0026**	<0.0005	**0.0852**	<0.0005	**0.0878**	**0.00**	**0.0024**	**0.0015**	**0.0006**	**0.0011**	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0005	<0.0013	<0.0013	<0.0013	<0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0970**
13-Oct-21	EB2131497079	Fuel Oil Tanks	FOT06-0.0	Soil	Leachate (ASLP)	<0.0080	<0.0080	**0.047**	<0.0080	**1.79**	<0.0080	**1.84**	**0.09**	**0.101**	**0.059**	**0.0183**	**0.0183**	**0.0135**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0199	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.008	<0.008	<0.008	<0.008	<0.008	**2.14**
Percent Leachable						-	-	36%	-	42%	-	42%	59%	84%	79%	61%	33%	45%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44%
13-Oct-21	EB2129940054	Fuel Oil Tanks	FOT06-0.0	Soil	Standard	<0.0005	<0.0005	**0.0026**	<0.0005	**0.0852**	<0.0005	**0.0878**	**0.00**	**0.0024**	**0.0015**	**0.0006**	**0.0011**	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0005	<0.0013	<0.0013	<0.0013	<0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0970**
13-Oct-21	EB2131497028	Fuel Oil Tanks	FOT06-0.0	Soil	Leachate (TCLP)	**0.0052**	**0.0049**	**0.0465**	**0.0053**	**0.92**	<0.0016	**0.966**	**0.13**	**0.122**	**0.0777**	**0.0234**	**0.0292**	**0.0069**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.002	**1.38**
Percent Leachable						-	-	36%	-	22%	-	22%	89%	102%	104%	78%	53%	23%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28%
13-Oct-21	EB2129940058	Fuel Oil Tanks	FOT07-0.0	Soil	Standard	**0.0009**	**0.0006**	**0.0151**	**0.0035**	**0.3**	**0.0023**	**0.315**	**0.00**	**0.0016**	**0.0018**	**0.0004**	**0.0031**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	**0.0003**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.3320**
13-Oct-21	EB2131497080	Fuel Oil Tanks	FOT07-0.0	Soil	Leachate (ASLP)	<0.160	<0.160	**0.512**	<0.160	**14.2**	<0.160	**14.7**	<0.800	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	<0.400	<0.160	<0.400	<0.400	<0.400	<0.400	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	**14.7**
Percent Leachable						-	-	68%	-	95%	-	93%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89%
13-Oct-21	EB2129940058	Fuel Oil Tanks	FOT07-0.0	Soil	Standard	**0.0009**	**0.0006**	**0.0151**	**0.0035**	**0.3**	**0.0023**	**0.315**	**0.00**	**0.0016**	**0.0018**	**0.0004**	**0.0031**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	**0.0003**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.3320**
13-Oct-21	EB2131497030	Fuel Oil Tanks	FOT07-0.0	Soil	Leachate (TCLP)	**0.0320**	**0.0176**	**0.434**	**0.112**	**6.88**	<0.0160	**7.31**	<0.0800	**0.0768**	**0.0608**	<0.0160	**0.104**	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0400	<0.0160	<0.040	<0.040	<0.040	<0.040	<0.0160	<0.0160	<0.016	<0.016	<0.016	<0.016	<0.016	**7.72**
Percent Leachable						71%	59%	57%	64%	46%	-	46%	-	96%	68%	-	67%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47%
13-Oct-21	EB2129940059	Fuel Oil Tanks	FOT07-0.5	Soil	Standard	**0.0242**	**0.0245**	**0.126**	**0.0134**	**0.529**	<0.0004	**0.655**	**0.01**	**0.0174**	**0.0507**	**0.0024**	**0.0081**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	**0.0012**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.8020**
13-Oct-21	EB2131497081	Fuel Oil Tanks	FOT07-0.5	Soil	Leachate (ASLP)	**1.6200**	**1.17**	**8.4**	**0.528**	**37.8**	<0.160	**46.2**	<0.800	**1.33**	**3.17**	<0.160	**0.432**	<0.160	<0.160	<0.160	<0.160	<0.160	<0.400	<0.160	<0.400	<0.400	<0.400	<0.400	<0.160	<0.160	<0.160	<0.160	<0.160	<0.160	**54.4**
Percent Leachable						134%	96%	133%	79%	143%	-	141%	-	153%	125%	-	107%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	136%
13-Oct-21	EB2129940059	Fuel Oil Tanks	FOT07-0.5	Soil	Standard	**0.0242**	**0.0245**	**0.126**	**0.0134**	**0.529**	<0.0004	**0.655**	**0.01**	**0.0174**	**0.0507**	**0.0024**	**0.0081**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	**0.0012**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.8020**
13-Oct-21	EB2131497031	Fuel Oil Tanks	FOT07-0.5	Soil	Leachate (TCLP)	**1.0200**	**0.656**	**4.95**	**0.296**	**16.7**	<0.0800	**21.6**	<0.400	**0.832**	**2.01**	**0.088**	**0.184**	<0.0800	<0.0800	<0.0800	<0.0800	<0.0800	<0.200	<0.0800	<0.200	<0.200	<0.200	<0.200	<0.0800	<0.0800	<0.080	<0.080	<0.080	<0.080	<0.080	**26.7**
Percent Leachable						84%	54%	79%	44%	63%	-	66%	-	96%	79%	73%	45%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67%
13-Oct-21	EB2129940064	Fuel Oil Tanks	FOT08-0.5	Soil	Standard	**0.0246**	**0.019**	**0.357**	**0.0224**	**0.998**	<0.0050	**1.36**	<0.025	**0.0162**	**0.0576**	<0.0050	**0.0162**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0125	<0.0050	<0.0125	<0.0125	<0.0125	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**1.5100**
13-Oct-21	EB2131497082	Fuel Oil Tanks	FOT08-0.5	Soil	Leachate (ASLP)	**1.5400**	**1.06**	**15.8**	**0.992**	**54.1**	<0.320	**69.9**	<1.60	**1.06**	**3.46**	<0.320	**0.864**	<0.320	<0.320	<0.320	<0.320	<0.320	<0.800	<0.320	<0.800	<0.800	<0.800	<0.800	<0.320	<0.320	<0.320	<0.320	<0.320	<0.320	**78.9**
Percent Leachable						125%	112%	89%	89%	108%	-	103%	-	131%	120%	-	107%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105%
13-Oct-21	EB2129940064	Fuel Oil Tanks	FOT08-0.5	Soil	Standard	**0.0246**	**0.019**	**0.357**	**0.0224**	**0.998**	<0.0050	**1.36**	<0.025	**0.0162**	**0.0576**	<0.0050	**0.0162**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0125	<0.0050	<0.0125	<0.0125	<0.0125	<0.0125	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	**1.5100**
13-Oct-21	EB2131497035	Fuel Oil Tanks	FOT08-0.5	Soil	Leachate (TCLP)	**1.1500**	**0.896**	**13.3**	**1.04**	**36.6**	<0.0800	**49.9**	<0.400	**0.792**	**2.59**	**0.144**	**0.608**	<0.0800	<0.0800	<0.0800	<0.0800	<0.0800	<0.200	<0.0800	<0.200	<0.200	<0.200	<0.200	<0.0800	<0.0800	<0.080	<0.080	<0.080	<0.080	<0.080	**57.1**
Percent Leachable						93%	94%	75%	93%	73%	-	73%	-	98%	90%	-	75%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76%
13-Oct-21	EB2129940068	Fuel Oil Tanks	FOT09-0.0	Soil	Standard	<0.0002	<0.0002	**0.0011**	<0.0002	**0.0132**	<0.0002	**0.0143**	<0.001	**0.0009**	**0.0006**	**0.0012**	**0.0013**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0187**
14-Oct-21	EB2131497083	Fuel Oil Tanks	FOT09-0.0	Soil	Leachate (ASLP)	<0.0032	<0.0032	**0.0252**	<0.0032	**0.535**	<0.0032	**0.56**	<0.0159	**0.0303**	**0.0182**	**0.0549**	**0.0351**	**0.0076**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	**0.006**	<0.003	**0.712**
Percent Leachable						-	-	46%	-	81%	-	78%	-	67%	61%	92%	54%	38%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	76%
13-Oct-21	EB2129940068	Fuel Oil Tanks	FOT09-0.0	Soil	Standard	<0.0002	<0.0002	**0.0011**	<0.0002	**0.0132**	<0.0002	**0.0143**	<0.001	**0.0009**	**0.0006**	**0.0012**	**0.0013**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0187**
13-Oct-21	EB2131497039	Fuel Oil Tanks	FOT09-0.0	Soil	Leachate (TCLP)	**0.0016**	**0.0042**	**0.0361**	**0.0016**	**0.296**	<0.0008	**0.332**	**0.03**	**0.0477**	**0.0257**	**0.0517**	**0.0528**	**0.0113**	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.002**	**0.003**	<0.001	**0.565**
Percent Leachable						-	-	66%	-	45%	-	46%	-	106%	96%	86%	81%	57%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60%
14-Oct-21	EB2129941010	Fuel Oil Tanks	FOT13-0.0	Soil	Standard	<0.0002	<0.0002	**0.0011**	**0.0004**	**0.119**	**0.0006**	**0.12**	<0.001	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1220**
14-Oct-21	EB2131497084	Fuel Oil Tanks	FOT13-0.0	Soil	Leachate (ASLP)	<0.0319	<0.0319	**0.0511**	<0.0319	**5.55**	<0.0319	**5.6**	<0.160	<0.0319	<0.0319	<0.0319	**0.0415**	<0.0319	<0.0319	<0.0319	<0.0319	<0.0319	<0.0798	<0.0319	<0.080	<0.080	<0.080	<0.080	<0.0319	<0.0319	<0.032	<0.032	<0.032	<0.032	<0.032	**5.64**
Percent Leachable						-	-	68%	-	93%	-	93%	-	-	-	-	104%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92%
14-Oct-21	EB2129941010	Fuel Oil Tanks	FOT13-0.0	Soil	Standard	<0.0002	<0.0002	**0.0011**	**0.0004**	**0.119**	**0.0006**	**0.12**	<0.001	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1220**
14-Oct-21	EB2131497040	Fuel Oil Tanks	FOT13-0.0	Soil	Leachate (TCLP)	<0.0032	<0.0032	**0.0332**	**0.0156**	**2.88**	<0.0032	**2.91**	<0.0160	**0.0118**	**0.0128**	**0.0038**	**0.0284**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.003	**2.98**
Percent Leachable						-	-	60%	-	48%	-	49%	-	-	85%	-	71%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49%
14-Oct-21	EB2129941019	Fuel Oil Tanks	FOT15-0.5	Soil	Standard	<0.0002	<0.0002	**0.0007**	<0.0002	**0.0543**	**0.0002**	**0.055**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0552**
14-Oct-21	EB2131497085	Fuel Oil Tanks	FOT15-0.5	Soil	Leachate (ASLP)	<0.0159	<0.0159	**0.027**	<0.0159	**2.29**	<0.0159	**2.32**	<0.0794	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0397	<0.0159	<0.040	<0.040	<0.040	<0.040	<0.0159	<0.0159	<0.016	<0.016	<0.016	<0.016	<0.016	**2.32**
Percent Leachable						-	-	77%	-	84%	-	84%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84%
14-Oct-21	EB2129941019	Fuel Oil Tanks	FOT15-0.5	Soil	Standard	<0.0002	<0.0002	**0.0007**	<0.0002	**0.0543**	**0.0002**	**0.055**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0552**
14-Oct-21	EB2131497044	Fuel Oil Tanks	FOT15-0.5	Soil	Leachate (TCLP)	<0.0032	<0.0032	**0.023**	**0.0042**	**1.27**	<0.0032	**1.29**	<0.0160	<0.0032	**0.0045**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.003	**1.3**
Percent Leachable						-	-	68%	-	47%	-	47%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47%
14-Oct-21	EB2129941026	Fuel Oil Tanks	FOT18-0.1	Soil	Standard	**0.0062**	**0.0131**	**0.259**	**0.0185**	**0.175**	<0.0025	**0.434**	<0.012	**0.0216**	**0.0683**	**0.028**	**0.15**	**0.0036**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0062	<0.0025	<0.0062	<0.0062	<0.0062	<0.0062	<0.0025	<0.0025	<0.0025	**1.5600**	**0.1330**	**0.0031**	**2.4400**
14-Oct-21	EB2131497086	Fuel Oil Tanks	FOT18-0.1	Soil	Leachate (ASLP)	<0.800	<0.800	**16.2**	**0.88**	**10.4**	<0.800	**26.6**	<4.00	**1.6**	**4.56**	**1.68**	**10.2**	<0.800	<0.800	<0.800	<0.800	<0.800	<2.00	<0.800	<2.00	<2.00	<2.00	<2.00	<0.800	<0.800	<0.800	**132**	**6.56**	<0.800	**184**
Percent Leachable						-	-	125%	95%	119%	-	123%	-	148%	134%	120%	136%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	113%	80%	-	94%
14-Oct-21	EB2129941026	Fuel Oil Tanks	FOT18-0.1	Soil	Standard	**0.0062**	**0.0131**	**0.259**	**0.0185**	**0.175**	<0.0025	**0.434**	<0.012	**0.0216**	**0.0683**	**0.028**	**0.15**	**0.0036**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0062	<0.0025	<0.0062	<0.0062	<0.0062	<0.0062	<0.0025	<0.0025	<0.0025	**1.5600**	**0.1330**	**0.0031**	**2.4400**
14-Oct-21	EB2131497046	Fuel Oil Tanks	FOT18-0.1	Soil	Leachate (TCLP)	<0.800	<0.800	**17.7**	**0.88**	**7.92**	<0.800	**25.6**	<4.00	**1.52**	**4.72**	**1.84**	**10.7**	<0.800	<0.800	<0.800	<0.800	<0.800	<2.00	<0.800	<2.00	<2.00	<2.00	<2.00	<0.800	<0.800	<0.800	**155**	**3.52**	<0.800	**204**
Percent Leachable						-	-	137%	95%	91%	<0.0025	118%	-	141%	138%	131%	143%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	199%	53%	-	167%
14-Oct-21	EB2129941027	Fuel Oil Tanks	FOT18-0.6	Soil	Standard	<0.0025	<0.0025	**0.0176**	**0.0026**	**0.262**	<0.0025	**0.28**	<0.012	**0.0026**	**0.0053**	<0.0025	**0.015**	**0.0042**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0062	<0.0025	<0.0062	<0.0062	<0.0062	<0.0062	<0.0025	<0.0025	<0.0025	**0.1590**	**0.5420**	<0.0025	**1.0100**
14-Oct-21	EB2131497087	Fuel Oil Tanks	FOT18-0.6	Soil	Leachate (ASLP)	<0.161	<0.161	**1.27**	**0.242**	**19.8**	<0.161	**21.1**	<0.805	**0.258**	**0.515**	<0.161	**1.32**	**0.225**	<0.161	<0.161	<0.161	<0.161	<0.402	<0.161	<0.402	<0.402	<0.402	<0.402	<0.161	<0.161	<0.161	**13.5**	**35.3**	<0.161	**72.4**
Percent Leachable						-	-	144%	186%	151%	-	151%	-	198%	194%	-	176%	107%	-	-	-	-	-	-	-	-	-	-	-	-	-	170%	130%	-	143%
14-Oct-21	EB2129941027	Fuel Oil Tanks	FOT18-0.6	Soil	Standard	<0.0025	<0.0025	**0.0176**	**0.0026**	**0.262**	<0.0025	**0.28**	<0.012	**0.0026**	**0.0053**	<0.0025	**0.015**	**0.0042**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0062	<0.0025	<0.0062	<0.0062	<0.0062	<0.0062	<0.0025	<0.0025	<0.0025	**0.1590**	**0.5420**	<0.0025	**1.0100**
14-Oct-21	EB2131497047	Fuel Oil Tanks	FOT18-0.6	Soil	Leachate (TCLP)	**0.0329**	**0.0603**	**1.19**	**0.251**	**11.6**	<0.0565	**12.8**	<0.0685	**0.194**	**0.468**	**0.17**	**1.18**	**0.225**	**0.119**	<

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Event: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T7: Leachate Comparison

Sample Date	Laboratory Sample Number	Sample Location/Area	Sample Number	Material Type	Analysis	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg / µg/L)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg / µg/L)												Perfluoroalkyl Sulfonamides (mg/kg / µg/L)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg / µg/L)				Total PFAS (mg/kg / µg/L)
						PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)						-	-	-	-	**0.00023**	-	-	-	-	-	-	**19**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)						-	-	-	-	**0.13**	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water						-	-	**0.07**	-	**0.07**	-	**0.07**	-	-	-	-	**0.56**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water						-	-	**0.7**	-	**0.7**	-	**0.7**	-	-	-	-	**5.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L)) - Standard Analysis						0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005
Laboratory Level of Reporting (µg/L)) - TOPA						0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002
Percent Leachable								47%		37%		38%		127%	103%	66%	67%	52%	42%	19%													31%	16%	47%
12-Oct-21	EB2129938037	Fire Training Ground	FTG13-0.0	Soil	Standard	<0.0002	<0.0002	**0.0004**	<0.0002	**0.009**	<0.0002	**0.0094**	<0.001	**0.0005**	**0.0003**	**0.0004**	**0.0007**	**0.0017**	**0.001**	**0.0004**	**0.0002**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	**0.0020**	**0.0009**	**0.0175**
12-Oct-21	EB2131497008	Fire Training Ground	FTG13-0.0	Soil	Leachate (TCLP)	<0.0008	<0.0008	**0.0094**	**0.0015**	**0.167**	<0.0012	**0.176**	**0.02**	**0.0255**	**0.0154**	**0.0171**	**0.029**	**0.0645**	**0.0197**	<0.0020	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	**0.014**	**0.025**	<0.001	**0.41**
Percent Leachable								47%		37%		37%		102%	103%	86%	83%	76%	39%														25%	-	47%
13-Oct-21	EB2129938054	Fire Training Ground	FTG19-0.0	Soil	Standard	<0.0002	<0.0002	**0.0007**	**0.0002**	**0.0044**	<0.0002	**0.0051**	<0.001	**0.0009**	**0.0005**	**0.0007**	**0.001**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	**0.0087**
13-Oct-21	EB2131497072	Fire Training Ground	FTG19-0.0	Soil	Leachate (ASLP)	**0.0054**	<0.0032	**0.0319**	**0.0083**	**0.2**	<0.0032	**0.232**	**0.02**	**0.0501**	**0.0265**	**0.0303**	**0.0469**	**0.0115**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.431**
Percent Leachable								91%	83%	91%		91%		111%	106%	87%	94%	77%															99%
13-Oct-21	EB2129938054	Fire Training Ground	FTG19-0.0	Soil	Standard	<0.0002	<0.0002	**0.0007**	**0.0002**	**0.0044**	<0.0002	**0.0051**	<0.001	**0.0009**	**0.0005**	**0.0007**	**0.001**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	**0.0087**
13-Oct-21	EB2131497010	Fire Training Ground	FTG19-0.0	Soil	Leachate (TCLP)	**0.0048**	**0.0027**	**0.0254**	**0.0078**	**0.132**	<0.0005	**0.157**	**0.02**	**0.0392**	**0.0245**	**0.027**	**0.0379**	<0.0069	<0.0005	<0.0005	<0.0005	<0.0005	<0.0008	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	**0.003**	<0.001	<0.001	**0.327**
Percent Leachable								73%	78%	60%		62%		87%	98%	77%	76%																75%
13-Oct-21	EB2129938060	Fire Training Ground	FTG21-0.0	Soil	Standard	**0.0003**	**0.0012**	**0.0416**	**0.0013**	**0.0094**	<0.0002	**0.042**	<0.001	**0.0008**	**0.0036**	**0.0016**	**0.0175**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	**0.0024**	<0.0005	<0.0005	**0.0707**
13-Oct-21	EB2131497073	Fire Training Ground	FTG21-0.0	Soil	Leachate (ASLP)	**0.0157**	**0.0634**	**1.8**	**0.04**	**0.0202**	<0.0032	**1.82**	<0.0160	**0.0579**	**0.185**	**0.0909**	**0.66**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.097**	<0.003	<0.004	**3.03**
Percent Leachable						105%	106%	87%	62%	101%	<0.0002	87%		145%	103%	114%	75%															81%	-	86%
13-Oct-21	EB2129938060	Fire Training Ground	FTG21-0.0	Soil	Standard	**0.0003**	**0.0012**	**0.0416**	**0.0013**	**0.0094**	<0.0002	**0.042**	<0.001	**0.0008**	**0.0036**	**0.0016**	**0.0175**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	**0.0024**	<0.0005	<0.0005	**0.0707**
13-Oct-21	EB2131497011	Fire Training Ground	FTG21-0.0	Soil	Leachate (TCLP)	**0.0125**	**0.0522**	**1.64**	**0.048**	**0.0166**	<0.0032	**1.66**	<0.0160	**0.0442**	**0.16**	**0.0784**	**0.73**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.119**	<0.003	<0.003	**2.9**
Percent Leachable						83%	87%	79%	74%	83%	-	79%		111%	89%	98%	83%																82%
13-Oct-21	EB2129938061	Fire Training Ground	FTG21-0.5	Soil	Standard	**0.0113**	**0.014**	**0.0389**	**0.0003**	**0.0044**	<0.0002	**0.0433**	**0.001**	**0.0069**	**0.0611**	**0.0068**	**0.0029**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.148**
13-Oct-21	EB2131497074	Fire Training Ground	FTG21-0.5	Soil	Leachate (ASLP)	**0.5550**	**0.676**	**1.74**	**0.0096**	**0.217**	<0.0080	**1.96**	**0.04**	**0.36**	**2.82**	**0.336**	**1.134**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0200	<0.0080	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	<0.008	<0.008	<0.008	<0.008	**5.89**
Percent Leachable						98%	97%	89%	64%	99%	-	91%	80%	104%	92%	99%	92%																93%
13-Oct-21	EB2129938061	Fire Training Ground	FTG21-0.5	Soil	Standard	**0.0113**	**0.014**	**0.0389**	**0.0003**	**0.0044**	<0.0002	**0.0433**	**0.001**	**0.0069**	**0.0611**	**0.0068**	**0.0029**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.148**
13-Oct-21	EB2131497012	Fire Training Ground	FTG21-0.5	Soil	Leachate (TCLP)	**0.5400**	**0.564**	**1.57**	**0.0102**	**0.138**	<0.0032	**1.71**	**0.05**	**0.362**	**2.88**	**0.3**	**0.118**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**6.52**
Percent Leachable						96%	79%	81%	68%	63%	-	79%	103%	105%	94%	88%	81%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88%
13-Oct-21	EB2129938062	Fire Training Ground	FTG21-1.0	Soil	Standard	**0.0005**	**0.0011**	**0.0075**	**0.0007**	**0.0509**	<0.0002	**0.0584**	<0.001	**0.0003**	**0.003**	**0.0005**	**0.0014**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0659**
13-Oct-21	EB2131497013	Fire Training Ground	FTG21-1.0	Soil	Leachate (ASLP)	**0.0206**	**0.0397**	**0.275**	**0.019**	**1.71**	<0.0159	**1.86**	<0.0794	**0.0177**	**0.121**	**0.0206**	**0.0492**	<0.0159	<0.0159	<0.0159	<0.0159	<0.0159	<0.0397	<0.0159	<0.040	<0.040	<0.040	<0.040	<0.0159	<0.0159	<0.016	<0.016	<0.016	<0.016	**2.27**
Percent Leachable						82%	72%	73%	54%	67%	-	68%	-	117%	81%	82%	70%																69%
13-Oct-21	EB2129938062	Fire Training Ground	FTG21-1.0	Soil	Standard	**0.0005**	**0.0011**	**0.0075**	**0.0007**	**0.0509**	<0.0002	**0.0584**	<0.001	**0.0003**	**0.003**	**0.0005**	**0.0014**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0659**
13-Oct-21	EB2131497013	Fire Training Ground	FTG21-1.0	Soil	Leachate (ASLP)	**0.0184**	**0.0363**	**0.248**	**0.0299**	**1.48**	<0.0016	**1.73**	<0.0080	**0.0144**	**0.115**	**0.0193**	**0.0454**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	**0.004**	<0.002	<0.002	**2.01**
Percent Leachable						74%	66%	66%	85%	58%	-	59%	-	96%	77%	77%	65%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61%
13-Oct-21	EB2129940018	Fire Training Ground	FTG40-0.0	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0011**	<0.0002	**0.0011**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0011**
13-Oct-21	EB2131497076	Fire Training Ground	FTG40-0.0	Soil	Leachate (ASLP)	<0.0032	<0.0032	<0.0032	<0.0032	**0.0096**	<0.0032	**0.0096**	<0.0160	**0.0051**	**0.0038**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.0185**
Percent Leachable						-	-	-	-	17%	-	17%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34%
13-Oct-21	EB2129940018	Fire Training Ground	FTG40-0.0	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0011**	<0.0002	**0.0011**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0011**
13-Oct-21	EB2131497019	Fire Training Ground	FTG40-0.0	Soil	Leachate (ASLP)	<0.0005	<0.0005	**0.002**	<0.0005	**0.00091**	<0.0005	**0.00111**	**0.01**	**0.0079**	**0.005**	**0.0048**	**0.0026**	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0008	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0393**
Percent Leachable						-	-	-	-	17%	-	20%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71%
13-Oct-21	EB2129940021	Fire Training Ground	FTG41-0.0	Soil	Standard	**0.0003**	**0.0002**	**0.0014**	<0.0002	**0.0138**	**0.0012**	**0.0152**	<0.001	**0.0013**	**0.0012**	**0.0011**	**0.0007**	**0.0006**	**0.0004**	**0.0004**	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	**0.0006**	<0.0005	**0.0232**
13-Oct-21	EB2131497020	Fire Training Ground	FTG41-0.0	Soil	Leachate (ASLP)	**0.0121**	**0.0086**	**0.0517**	**0.0032**	**0.153**	<0.0032	**0.205**	**0.02**	**0.0587**	**0.0555**	**0.0472**	**0.0252**	<0.0170	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	**0.024**	**0.004**	<0.003	**0.466**
Percent Leachable						81%	86%	74%	-	22%	-	27%	-	90%	93%	86%	72%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40%
03-Jul-23	EB2320334001	Fire Training Ground	CC01	Concrete	Standard	**0.0233**	**0.0164**	**0.0263**	**0.0006**	**0.015**	<0.0002	**0.0413**	**0.02**	**0.0354**	**0.1870**	**0.0391**	**0.0121**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	**0.0042**	**0.1330**	**0.0083**	<0.0005	**0.5160**
03-Jul-23	EB2320334001	Fire Training Ground	CC01	Concrete	Leachate	**0.693**	**0.324**	**0.524**	**0.0079**	**0.0858**	<0.0079	**0.61**	**0.597**	**1.24**	**5.2**	**1.13**	**0.302**	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0197	<0.0079	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	**0.12**	**4.5**	**0.069**	<0.008	**14.8**
Percent Leachable						59%	40%	40%	26%	11%	-	30%	80%	70%	56%	58%	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	57%	68%	17%	-	57%
03-Jul-23	EB2320334002	Fire Training Ground	CC02	Concrete	Standard	**0.0558**	**0.0579**	**0.221**	**0.0114**	**0.324**	<0.0005	**0.5450**	**0.02**	**0.0425**	**0.3080**	**0.051**	**0.0456**	**0.0015**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	**0.0008**	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	**0.0006**	**0.1330**	**0.0160**	**0.0045**	**1.2900**
03-Jul-23	EB2320334002	Fire Training Ground	CC02	Concrete	Leachate	**1.5**	**0.966**	**3.77**	**0.226**	**4.2**	<0.080	**7.97**	**0.666**	**1.16**	**5**	**0.806**	**0.966**	**0.0296**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0200	**0.0136**	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	**0.014**	**3.2**	**0.167**	<0.008	**22.7**
Percent Leachable						54%	33%	34%	40%	26%	-	29%	70%	55%	32%	32%	42%	39%	-	-	-	-	-	34%	-	-	-	-	-	-	47%	48%	21%	-	35%
03-Jul-23	EB2320334003	Fire Training Ground	CC03	Concrete	Standard	**0.0233**	**0.0195**	**0.0532**	**0.0012**	**0.0199**	<0.0002	**0.0731**	**0.02**	**0.0296**	**0.1460**	**0.0284**	**0.0231**	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	**0.0010**	**0.1590**	**0.0108**	**0.0007**	**0.5320**
03-Jul-23	EB2320334003	Fire Training Ground	CC03	Concrete	Leachate	**1.2**	**0.69**	**1.75**	**0.0349**	**0.314**	<0.0079	**2.06**	**0.937**	**1.71**	**6.86**	**1.12**	**0.667**	**0.0143**	<0.0079	<0.0079	<0.0079	<0.0079	<0.0198	<0.0079	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	**0.052**	**5.29**	**0.085**	<0.008	**20.7**
Percent Leachable						103%	71%	66%	58%	32%	-	56%	125%	116%	94%	79%	58%	36%	-	-	-	-	-	-	-	-	-	-	-	-	104%	67%	16%	-	78%
03-Jul-23	EB2320334004	Fire Training Ground	CC04	Concrete	Standard	**0.0157**	**0.0159**	**0.0838**	**0.0094**	**0.209**	<0.0002	**0.293**	**0.01**	**0.0114**	**0.0662**	**0.0161**	**0.0279**	**0.0011**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0006	**0.0006**	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	**0.1280**	**0.0135**	**0.0016**	**0.6090**
03-Jul-23	EB2320334004	Fire Training Ground	CC04	Concrete	Leachate	**0.578**	**0.528**	**3.29**	**0.326**	**5.16**	<0.0079	**8.45**	**0.3**	**0.449**	**2.54**	**0.783**	**1.09**	**0.0443**	**0.0111**	<0.0079	<0.0079	<0.0079	<0.0198	**0.0158**	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	**0.017**	**6.29**	**0.29**	<0.008	**22.2**
Percent Leachable						74%	66%	79%	69%	49%	-	58%	75%	79%	77%	97%	78%	81%	56%	-	-	-	-	53%	-	-	-	-	-	-	-	106%	43%	-	73%
15-Oct-21	EB2129941094	Fire Training Ground	SS02	Soil	Standard	**0.0003**	<0.0002	**0.0008**	<0.0002	**0.0278**	<0.0002	**0.0286**	<0.001	**0.0006**	**0.0004**	**0.0004**	**0.0004**	**0.0005**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0315**
14-Oct-21	EB2131497096	Fire Training Ground	SS02	Soil	Leachate (ASLP)	**0.0150**	**0.0042**	**0.0339**	<0.0032	**0.337**	<0.0032	**0.371**	**0.03**	**0.0288**	**0.0237**	**0.017**	**0.0118**	**0.0067**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.504**
Percent Leachable						100%	-	85%	-	24%	-	26%	-	96%	119%	85%	59%	27%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32%
15-Oct-21	EB2129941094	Fire Training Ground	SS02	Soil	Standard	**0.0003**	<0.0002	**0.0008**	<0.0002	**0.0278**	<0.0002	**0.0286**	<0.001	**0.0006**	**0.0004**	**0.0004**	**0.0004**	**0.0005**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0315**
14-Oct-21	EB2131497065	Fire Training Ground	SS02	Soil	Leachate (TCLP)	**0.0134**	<0.0032	**0.0252**	<0.0032	**0.303**	<0.0032	**0.328**	**0.03**	**0.0281**	**0.0179**	**0.0137**	**0.0086**	<0.0077	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**0.439**
Percent Leachable						89%	-	63%	-	22%	-	23%	-	94%	90%	69%	43%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28%
29-Jun-22	EB2221198006	Callide A	CA15-0.5	Soil	Standard	<0.0004	**0.0007**	**0.0072**	**0.0015**	**0.0552**	<0.0002	**0.0624**	<0.002	<0.0006	<0.0007	**0.0003**	**0.0006**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0655**
28-Jun-22	EB2222206001	Callide A	CA15-0.5	Soil	Leachate (ASLP)	<0.0160	<0.0160	**0.0704**	<0.0160	**0.453**	<0.0160	**0.523**	<0.0800	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0160	<0.0400	<0.0160	<0.040	<0.040	<0.040	<0.040	<0.0160	<0.0160	<0.016	<0.016	<0.016	<0.016	**0.5230**
Percent Leachable						-	-	20%	-	16%	-	17%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16%
03-Nov-20	-	Western Seepage Collection Pond	SW03-SED	Sediment	Standard	<0.0005	<0.0005	<0.0005	<0.0005	**0.0022**	<0.0005	**0.0022**	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0022**
03-Nov-20	-	Western Seepage Collection Pond	SW3-SED	Sediment	Leachate (ASLP)	<0.0016	<0.0016	**0.0137**	<0.0016	**0.13**	<0.0016	**0.144**	<0.0030	<0.0020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.144**
Percent Leachable						-	-	-	-	118%	-	131%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	131%
04-Nov-20	-	Eastern Seepage Collection Pond	SW04-SED	Sediment	Standard	<0.0005	<0.0005	<0.0005	<0.0005	**0.0012**	<0.0005	**0.0012**	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0012**
04-Nov-20	-	Eastern Seepage Collection Pond	SW4-SED	Sediment	Leachate (ASLP)	<0.0016	<0.0016	<0.0016	<0.0016	**0.0131**	<0.0016	**0.0131**	<0.0040	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0131**
Percent Leachable						-	-	-	-	22%	-	22%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22%
04-Nov-20	-	Drains Reclaim Dam	DRD-SED	Sediment	Standard	<0.0010	<0.0010	**0.0011**	<0.0010	**0.0067**	<0.0010	**0.0078**	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0078**
04-Nov-20	-	Drains Reclaim Dam	DRD-SED	Sediment	Leachate (ASLP)	<0.0016	<0.0016	**0.0131**	<0.0016	**0.0506**	<0.0016	**0.0637**	<0.0050	<0.0016	<0.0016	<0.0016	<0.0016	**0.0032**	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.0637**
Percent Leachable						-	-	24%	-	15%	-	16%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16%
28-Apr-22	EB2212041003	Ash Dam B	TP01_AD_0.5	Ash	Standard	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0006**	<0.0002	**0.0008**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0008**
28-Apr-22	EB2215146001	Ash Dam B	TP01_AD_0.5	Ash	Leachate	<0.0005	<0.0005	**0.0013**	<0.0005	**0.0032**	<0.0005	**0.0045**	<0.0090	<0.0005	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0045**
Percent Leachable						-	-	13%	-	11%	-	11%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11%
11-Dec-23	EB2339725006	Eastern clean water drain	EDC-SED-6	Sediment	Standard	**0.0059**	**0.0078**	**0.0647**	**0.0051**	**0.2300**	<0.0002	**0.295**	**0.001**	**0.0016**	**0.0097**	**0.0013**	**0.0029**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.33**
11-Dec-23	EB2400645001	Eastern clean water drain	EDC-SED-6	Sediment	Leachate (ASLP)	**0.2020**	**0.236**	**1.88**	**0.13**	**3.99**	<0.0032	**5.87**	**0.0474**	**0.057**	**0.3090**	**0.0401**	**0.0913**	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	**6.98**
Percent Leachable						68%	61%	58%	51%	35%	-	40%	95%	71%	64%	62%	63%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42%

NOTES:

1	Analyte exceeds the PFAS NEMP Freshwater 99% Species Protection
1	Analyte exceeds the PFAS NEMP Freshwater 95% Species Protection
1	Analyte exceeds the PFAS NEMP Health Based - Drinking Water
1	Analyte exceeds the PFAS NEMP Health Based - Recreational Water

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Event: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T8: PFAS Analytical Results Quality Assurance Review - Water Samples

Sample Date	Sample Number	Material Type	Total Organic Fluorine (TOF) (µg/L)			Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)			Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)			Perfluoroalkyl Sulfonamides (µg/L)			Fluorotelomer Sulfonic Acids (FSA) (µg/L)			Perfluoroalkyl Acids (PFAA) Precursors		Total PFAS (µg/L)		
			TOF	Percent accounted in Standard Analysis	Percent accounted in TOPA	Total PSA (pre-TOPA)	Total PSA (post-TOPA)	Percent Increase (%)	Total PCA (pre-TOPA)	Total PCA (post-TOPA)	Percent Increase (%)	Total PFS (pre-TOPA)	Total PFS (post TOPA)	Percent Increase (%)	Total FSA (pre-TOPA)	Total FSA (post-TOPA)	Percent Increase (%)	Sum of PFAA Precursors (TOPA)	PFAA Precursors Percent Post Oxidation (%)	Total PFAS (pre-TOPA)	Total PFAS (post-TOPA)	Percent Increase (%)
NEMP 2.0 Laboratory QA Criteria			-	>10%[A]	>10%[A]	-	-	>0%[B]	-	-	>0%[B]	-	<LOR[C]	-	-	<LOR[C]	-	-	<5%[D]	-	-	>-10%[E]
Laboratory Level of Reporting (µg/L) - Water			0.1	-	-	0.0005-0.001	0.01-0.002	-	0.005-0.02	0.05-0.01	-	0.0005-0.005	0.002-0.05	-	0.001-0.002	0.005-0.01	-	0.002-0.05	-	0.0002-0.005	0.002-0.1	-
Laboratory Level of Reporting (mg/kg) - Solid			1	-	-	0.0005	0.0002	-	0.0005	0.0002	-	0.0005	0.0002	-	0.0005	0.0005	-	0.0005	-	0.0005	0.0002	-
Groundwater																						
03-Nov-20	MW01	Groundwater	<20	NA	NA	<0.0016	<0.002	NA	**0.0100**	**0.029**	**190**	<0.0016	<0.002	NA	**0.0400**	<0.005	NA	<0.005	NA	**0.0500**	**0.0290**	**-42**
03-Nov-20	MW09	Groundwater	<20	NA	NA	**0.1066**	**0.155**	**45**	<0.0008	**0.016**	NA	<0.0008	<0.002	NA	**0.0070**	<0.005	NA	<0.005	NA	**0.1140**	**0.1710**	**50**
20-Jan-21	MW09	Groundwater	<20	NA	NA	**0.0915**	**0.101**	**10**	<0.0005	**0.014**	NA	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.005	NA	**0.0915**	**0.1150**	**26**
20-Jan-21	SW20	Groundwater	<20	NA	NA	<0.0005	<0.002	NA	<0.0005	**0.005**	NA	<0.0005	<0.002	NA	<0.0005	<0.002	NA	<0.005	NA	<0.0002	**0.0050**	NA
03-Nov-20	MW41	Groundwater	<40	NA	NA	**0.7783**	**1.06**	**36**	<0.0079	**0.101**	NA	<0.0079	<0.002	NA	**0.0090**	<0.005	NA	<0.005	NA	**0.7870**	**1.1600**	**47**
21-Jan-21	MW41	Groundwater	<20	NA	NA	**1.3469**	**1.401**	**4**	<0.0016	**0.067**	NA	<0.004	<0.005	NA	<0.002	<0.005	NA	<0.005	NA	**0.7180**	**0.8170**	**14**
20-Jan-21	MW43	Groundwater	<20	NA	NA	**1.2180**	**1.179**	**-3**	**0.3912**	**0.517**	**32**	<0.0160	<0.002	NA	**0.0040**	<0.005	NA	<0.005	NA	**1.6100**	**1.7000**	**6**
03-Nov-20	MW49	Groundwater	<20	NA	NA	**3.7744**	**4.38**	**16**	<0.0160	**0.294**	NA	<0.0160	<0.002	NA	<0.016	<0.005	NA	<0.005	NA	**3.7700**	**4.6700**	**24**
03-Nov-20	GQA01 (MW49)	Groundwater	<40	NA	NA	**3.7470**	**4.84**	**29**	<0.0160	**0.309**	NA	<0.0160	<0.002	NA	<0.016	<0.005	NA	<0.005	NA	**3.7500**	**5.1500**	**37**
21-Jan-21	MW49	Groundwater	<20	NA	NA	**5.4826**	**7.262**	**32**	**0.0179**	**0.269**	**1,403**	<0.008	<0.005	NA	<0.003	<0.005	NA	<0.005	NA	**2.9500**	**4.1900**	**42**
19-Jan-21	MW68	Groundwater	<20	NA	NA	**0.8660**	**0.905**	**5**	<0.0008	**0.169**	NA	<0.002	<0.005	NA	<0.001	<0.005	NA	<0.005	NA	**0.4740**	**0.6620**	**40**
05-Mar-21	MW69	Groundwater	<400	NA	NA	**0.1119**	**0.1**	**-11**	**0.0157**	**0.109**	**594**	<0.0032	<0.009	NA	<0.003	<0.009	NA	<0.009	NA	**0.1430**	**0.2090**	**46**
05-Mar-21	MW70	Groundwater	<400	NA	NA	**0.1271**	**0.1555**	**22**	**0.0448**	**0.025**	**-44**	<0.0032	<0.010	NA	<0.003	<0.010	NA	<0.010	NA	**0.1720**	**0.3860**	**124**
05-Mar-21	MW71	Groundwater	<20	NA	NA	**0.0294**	**0.048**	**63**	<0.0005	**0.0105**	NA	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.002	NA	**0.1470**	**0.1650**	**12**
19-Jan-21	MW73	Groundwater	<20	NA	NA	**0.2240**	**0.186**	**-17**	**0.0027**	**0.027**	**900**	<0.002	<0.005	NA	**0.0090**	<0.005	NA	<0.002	NA	**0.1270**	**0.1210**	**-5**
03-Nov-20	MW74	Groundwater	<20	NA	NA	**0.0456**	**0.03**	**-34**	**0.0073**	**0.031**	**325**	<0.0016	<0.002	NA	**0.0030**	<0.005	NA	<0.002	NA	**0.0559**	**0.0610**	**9**
20-Jan-21	MW79	Groundwater	<20	NA	NA	**0.0853**	**0.074**	**-13**	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.001	<0.005	NA	<0.002	NA	**0.0505**	**0.0430**	**-15**
15-Aug-23	MW78	Groundwater	<20	NA	NA	**0.0859**	**0.237**	**176**	<0.0005	**0.019**	NA	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.002	NA	**0.0859**	**0.2560**	**198**
19-Jan-21	MW80	Groundwater	<20	NA	NA	**0.0071**	**0.016**	**125**	**0.0037**	**0.008**	**116**	<0.002	<0.005	NA	**0.0110**	<0.005	NA	<0.002	NA	**0.0218**	**0.0160**	**-27**
04-Aug-23	V81_PT_01 (Pump Test	Groundwater	<20	NA	NA	**0.1656**	**0.154**	**-7**	<0.0039	**0.007**	NA	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.002	NA	**0.1660**	**0.1610**	**-3**
04-Aug-23	V81_PT_02 (Pump Test	Groundwater	<20	NA	NA	**0.3754**	**0.37**	**-1**	**0.0023**	**0.036**	**1,465**	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.002	NA	**0.3780**	**0.4060**	**7**
07-Aug-23	V82_PT_01 (Pump Test	Groundwater	<20	NA	NA	**0.0807**	**0.0703**	**-13**	<0.004	**0.016**	NA	<0.0016	<0.002	NA	<0.002	<0.005	NA	<0.002	NA	**0.0807**	**0.0890**	**10**
07-Aug-23	V82_PT_02 (Pump Test	Groundwater	<20	NA	NA	**0.0827**	**0.069**	**-17**	<0.0041	**0.016**	NA	<0.0016	<0.002	NA	<0.002	<0.005	NA	<0.002	NA	**0.0827**	**0.0850**	**3**
02-Aug-23	V83_PT_01 (Pump Test	Groundwater	<20	NA	NA	**0.1443**	**0.139**	**-4**	<0.0005	**0.006**	NA	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.002	NA	**0.1440**	**0.1450**	**1**
14-Aug-23	MW84	Groundwater	**30**	**133**	**134**	**31.5730**	**28.7**	**-9**	**8.2240**	**11.465**	**39**	<0.0317	<0.049	NA	<0.032	<0.049	NA	<0.049	NA	**39.8000**	**40.2000**	**1**
08-Sep-23	MW84	Groundwater	**30**	**162**	**145**	**39.5210**	**31.902**	**-19**	**9.1240**	**11.737**	**29**	<0.0152	<0.019	NA	<0.015	<0.019	NA	<0.0152	NA	**48.6000**	**43.6000**	**-10**
14-Aug-23	MW85	Groundwater	<20	NA	NA	**0.5819**	**0.562**	**-3**	**0.0415**	**0.056**	**35**	<0.0016	<0.002	NA	<0.002	<0.005	NA	<0.002	NA	**0.6230**	**0.6180**	**-1**
15-Aug-23	MW89	Groundwater	<20	NA	NA	**0.3015**	**0.302**	**0**	**0.0348**	**0.054**	**55**	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.002	NA	**0.3360**	**0.3560**	**6**
10-Aug-23	V90_PT_01 (Pump Test	Groundwater	<20	NA	NA	**0.2240**	**0.216**	**-4**	<0.0005	**0.005**	NA	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.002	NA	**0.2240**	**0.2210**	**-1**
10-Aug-23	V90_PT_02 (Pump Test	Groundwater	<20	NA	NA	**0.2283**	**0.211**	**-8**	<0.0005	**0.005**	NA	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.002	NA	**0.2280**	**0.2160**	**-5**
15-Aug-23	MW91	Groundwater	<20	NA	NA	**1.1984**	**1.13**	**-6**	**0.2795**	**0.287**	**3**	<0.0016	<0.002	NA	<0.002	<0.005	NA	<0.002	NA	**1.4800**	**1.4200**	**-4**
15-Aug-23	MW94	Groundwater	<20	NA	NA	**0.0862**	**0.083**	**-4**	<0.0005	**0.005**	NA	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.002	NA	**0.0862**	**0.0880**	**2**
15-Aug-23	MW98	Groundwater	<20	NA	NA	**0.1060**	**0.104**	**-2**	<0.0005	**0.01**	NA	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.002	NA	**0.1060**	**0.1140**	**8**
03-Nov-20	ESC1	Groundwater	<200	NA	NA	**0.0551**	**0.064**	**16**	<0.0153	**0.031**	NA	<0.0153	<0.010	NA	<0.015	<0.010	NA	<0.010	NA	**0.0551**	**0.0950**	**72**
20-Jan-21	ESC1	Groundwater	**20**	**0**	**0**	**0.0741**	**0.067**	**-10**	**0.0010**	**0.009**	**800**	<0.010	<0.0008	NA	<0.001	<0.005	NA	<0.005	NA	**0.0724**	**0.0760**	**5**
02-Nov-20	ESC3	Groundwater	<20	NA	NA	**0.0789**	**0.126**	**60**	<0.0016	**0.034**	NA	<0.0016	<0.002	NA	**0.0210**	<0.005	NA	<0.005	NA	**0.0999**	**0.1600**	**60**
20-Jan-21	ESC3	Groundwater	<20	NA	NA	**0.0935**	**0.082**	**-12**	**0.0133**	**0.032**	**141**	<0.0005	<0.002	NA	**0.0060**	<0.005	NA	<0.005	NA	**0.1130**	**0.1140**	**1**
Surface Water																						
19-Jan-21	SW02	Surface Water	<20	NA	NA	**0.0074**	**0.0180**	**143**	<0.0008	**0.002**	NA	<0.0008	<0.002	NA	<0.001	<0.005	NA	<0.005	NA	**0.0037**	**0.0120**	**224**
03-Nov-20	SW03	Surface Water	<20	NA	NA	**0.4864**	**0.629**	**29**	<0.0016	**0.142**	NA	<0.0016	<0.002	NA	<0.002	<0.005	NA	<0.005	NA	**0.4860**	**0.7710**	**59**
04-Nov-20	SW04	Surface Water	<20	NA	NA	**0.0848**	**0.129**	**52**	<0.0080	**0.009**	NA	<0.0080	<0.002	NA	<0.008	<0.005	NA	<0.005	NA	**0.0848**	**0.1380**	**63**
04-Nov-20	SW12	Surface Water	<20	NA	NA	**0.0072**	**0.006**	**-17**	<0.0005	<0.002	NA	<0.0005	<0.002	NA	<0.001	<0.005	NA	<0.005	NA	**0.0072**	**0.0060**	**-17**
20-Jan-21	SW12	Surface Water	<20	NA	NA	**0.0095**	**0.01**	**5**	<0.0008	**0.002**	NA	<0.0008	<0.002	NA	<0.001	<0.005	NA	<0.005	NA	**0.0056**	**0.0070**	**25**
19-Jan-21	SW22	Surface Water	<20	NA	NA	**0.0398**	**0.04**	**1**	<0.0005	**0.005**	NA	<0.0008	<0.002	NA	<0.001	<0.005	NA	<0.005	NA	**0.0212**	**0.0250**	**18**
19-Jan-21	SW23	Surface Water	<20	NA	NA	**0.0316**	**0.032**	**1**	<0.0008	**0.006**	NA	<0.0008	<0.002	NA	<0.001	<0.005	NA	<0.005	NA	**0.0163**	**0.0220**	**35**
04-Nov-20	DRD	Surface Water	<20	NA	NA	**0.0286**	**0.052**	**82**	<0.0077	**0.046**	NA	<0.0077	<0.002	NA	<0.008	<0.005	NA	<0.005	NA	**0.0286**	**0.0980**	**243**

NOTES:
1 QA Result Exceeds Adopted Criteria - Refer NEMP 2.0, Section 19.2
A >10% adopted to indicate a 'high' percentage of other PFAS through comparison of TOF and Total PFAS analysis. Refer Section 19.2.2 of NEMP 2.0
B Sum of PFCA/PFSA post-TOP Assay should be equal to or greater than the sum of PFCA/PFSA pre-TOP Assay, which signifies any precursors being converted to PFCA products (NEMP 2.0, Section 19.2.3)
C No PFAA precursors are detectable post oxidation, signifying complete oxidation (NEMP 2.0, Section 19.2.3)
D For aqueous samples, sum of [PFAA precursors] divided by sum of [Total PFAS] <5% (NEMP 2.0, Section 19.2.3)
E Total PFAS concentration post-TOP Assay should be greater or equal to the total PFAS concentration pre-TOP Assay, noting a decrease of up to 10% might be expected due to normal analytical variability (NEMP 2.0, Section 19.2.3)

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T9: PFAS Analytical Results Quality Assurance Review - Solid Samples

Sample Date	Sample Number	Material Type	Total Organic Fluorine (TOF) (µg/L)			Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)			Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)			Perfluoroalkyl Sulfonamides (µg/L)			Fluorotelomer Sulfonic Acids (FSA) (µg/L)			Perfluoroalkyl Acids (PFAA) Precursors		Total PFAS (µg/L)		
			TOF	Percent accounted in Standard Analysis	Percent accounted in TOPA	Total PSA (pre-TOPA)	Total PSA (post-TOPA)	Percent Increase (%)	Total PCA (pre-TOPA)	Total PCA (post-TOPA)	Percent Increase (%)	Total PFS (pre-TOPA)	Total PFS (post TOPA)	Percent Increase (%)	Total FSA (pre-TOPA)	Total FSA (post-TOPA)	Percent Increase (%)	Sum of PFAA Precursors (TOPA)	PFAA Precursors Percent Post Oxidation (%)	Total PFAS (pre-TOPA)	Total PFAS (post-TOPA)	Percent Increase (%)
NEMP 2.0 Laboratory QA Criteria			-	<90%[A]	<90%[A]	-	-	>0%[B]	-	-	>0%[B]	-	<LOR[C]	-	-	<LOR[C]	-	-	<5%[D]	-	-	>-10%[E]
Laboratory Level of Reporting (µg/L) - Water			0.1	-	-	0.0005-0.001	0.01-0.002	-	0.005-0.02	0.05-0.01	-	0.0005-0.005	0.002-0.05	-	0.001-0.002	0.005-0.01	-	0.002-0.05	-	0.0002-0.005	0.002-0.1	-
Laboratory Level of Reporting (mg/kg) - Solid			1	-	-	0.0005	0.0002	-	0.0005	0.0002	-	0.0005	0.0002	-	0.0005	0.0005	-	0.0005	-	0.0005	0.0002	-
Fuel Oil Tanks (FOT)																						
03-Nov-20	BH1-0.1-0.2	Soil	<1.0	NA	NA	0.5702	0.356	**-38**	0.0028	0.0269	861	<0.0010	<0.0005	NA	<0.0010	<0.0005	NA	<0.0010	NA	0.5730	0.3830	**-33**
03-Nov-20	BH2-0.0-0.1	Soil	<1.0	NA	NA	0.0594	0.0499	**-16**	0.0037	0.0099	168	<0.0005	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0631	0.0598	-5
03-Nov-20	QA03	Soil	<1.0	NA	NA	0.1147	0.0558	**-51**	0.0007	0.0051	629	<0.0005	<0.0005	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.1150	0.0609	**-47**
03-Nov-20	BH3-0.0-0.1	Soil	<1.0	NA	NA	0.2520	0.2161	**-14**	0.0041	0.0219	434	<0.0010	<0.0005	NA	<0.0010	<0.0005	NA	<0.0010	NA	0.2560	0.2380	-7
03-Nov-20	BH04-0.0-0.1	Soil	<1.0	NA	NA	0.0555	0.0446	**-20**	0.0031	0.0035	13	<0.0005	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0586	0.0481	**-18**
FOT04-0.0	FOT04-0.0	Soil	0.13	157	126	0.1943	0.1544	**-21**	0.0099	0.01	1	<0.0002	<0.0005	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.2040	0.1640	**-20**
FOT06-0.0	FOT06-0.0	Soil	0.23	**42**	**41**	0.0878	0.0887	1	0.0092	0.0067	**-27**	<0.0005	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0970	0.0954	-2
FOT07-0.0	FOT07-0.0	Soil	0.3	111	92	0.3224	0.2702	**-16**	0.0093	0.0062	**-33**	0.0003	<0.0010	NA	<0.0005	<0.0010	NA	**0.0003**	NA	0.3320	0.2760	**-17**
FOT07-0.5	FOT07-0.5	Soil	0.54	149	239	0.7171	1.1376	59	0.0836	0.1538	84	0.0012	<0.0026	NA	<0.0005	<0.0026	NA	**0.0012**	NA	0.8020	1.2900	61
FOT08-0.5	FOT08-0.5	Soil	1.53	99	135	1.4210	1.8488	30	0.0900	0.2212	146	<0.0050	<0.0026	NA	<0.0050	<0.0026	NA	<0.0026	NA	1.5100	2.0700	37
FOT09-0.0	FOT09-0.0	Soil	<0.10	NA	NA	0.0143	0.0157	10	0.0044	0.0048	9	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0187	0.0205	10
FOT13-0.0	FOT13-0.0	Soil	0.11	111	119	0.1211	0.1291	7	0.0011	0.0018	64	<0.0002	<0.0005	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.1220	0.1310	7
FOT15-0.5	FOT15-0.5	Soil	<0.10	NA	NA	0.0552	0.0443	**-20**	<0.0002	0.0003	50	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0552	0.0446	**-19**
FOT18-0.1	FOT18-0.1	Soil	4.04	**60**	**47**	0.4718	0.425	**-10**	0.2715	1.4601	438	<0.0025	<0.0053	NA	1.6961	0.0116	**-99**	**0.0116**	**0.61**	2.4400	1.9000	**-22**
FOT18-0.6	FOT18-0.6	Soil	1.21	**83**	**65**	0.2822	0.2484	**-12**	0.0271	0.5407	1,895	<0.0025	<0.0010	NA	0.7010	0.0015	**-100**	**0.0015**	**0.19**	1.0100	0.7910	**-22**
FOT19-0.0	FOT19-0.0	Soil	<0.10	NA	NA	0.0338	0.021	**-38**	0.0019	0.002	5	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0357	0.0230	**-36**
FOT19-0.3	FOT19-0.3	Soil	<0.10	NA	NA	0.0294	0.0162	**-45**	0.0014	0.0012	**-14**	<0.0002	<0.0002	NA	0.0014	<0.0005	**-64**	<0.0005	NA	0.0322	0.0174	**-46**
FOT20-0.5	FOT20-0.5	Soil	<0.10	NA	NA	0.0063	0.0073	16	0.0012	0.0025	108	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0075	0.0098	31
FOT26-0.0	FOT26-0.0	Soil	<0.10	NA	NA	0.0012	0.0011	**-8**	<0.0002	<0.0002	NA	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0012	0.0011	-8
Fire Training Ground (FTG)																						
04-Nov-20	FTG-SED1	Sediment	2	**15**	**32**	0.0872	0.0949	9	0.0489	0.5401	1,004	0.0009	<0.0026	NA	0.1639	<0.0026	NA	<0.0026	NA	0.3010	0.6350	111
04-Nov-20	FTG-SED2	Soil	10.4	**14**	**32**	0.2391	0.2703	13	0.1798	3.0983	1,623	0.0095	<0.0026	**-73**	0.9840	<0.0026	NA	<0.0026	NA	1.4100	3.3700	139
12-Oct-21	FTG04-0.0	Soil	0.11	**37**	**26**	0.0233	0.0131	**-44**	0.0151	0.0155	3	<0.0002	<0.0002	NA	0.0019	<0.0005	**-74**	<0.0005	NA	0.0403	0.0286	**-29**
12-Oct-21	FTG08-0.0	Soil	0.26	**50**	**53**	0.0482	0.0366	**-24**	0.0205	0.1009	392	<0.0002	<0.0003	NA	0.0625	0.0007	**-99**	**0.0007**	**0.51**	0.1310	0.1380	5
12-Oct-21	FTG08-0.4	Soil	0.18	**32**	**35**	0.0172	0.0156	**-9**	0.0083	0.0475	472	<0.0002	<0.0003	NA	0.0328	<0.0005	**-98**	<0.0005	NA	0.0583	0.0631	8
12-Oct-21	Concrete Core 10	Soil	0.57	123	111	0.4012	0.2609	**-35**	0.1866	0.3712	99	0.0012	<0.0005	**-58**	0.1118	<0.0005	**-100**	<0.0005	NA	0.7010	0.6320	-10
12-Oct-21	FTG10-0.3	Soil	0.18	**57**	**46**	0.0639	0.0524	**-18**	0.0331	0.0311	**-6**	<0.0002	<0.0002	NA	0.0052	<0.0005	**-90**	<0.0005	NA	0.1020	0.0835	**-18**
12-Oct-21	Concrete Core 12	Soil	<0.10	NA	NA	0.0028	0.0013	**-54**	0.0219	0.0113	**-48**	<0.0002	<0.0002	NA	0.0064	<0.0005	**-92**	<0.0005	NA	0.0311	0.0126	**-59**
12-Oct-21	FTG12-0.2	Soil	<0.10	NA	NA	0.0029	0.003	3	0.0016	0.0029	81	<0.0002	<0.0002	NA	0.0016	<0.0005	**-69**	<0.0005	NA	0.0061	0.0059	-3
12-Oct-21	FTG13-0.0	Soil	0.12	**15**	**19**	0.0094	0.0088	**-6**	0.0052	0.014	169	<0.0002	<0.0002	NA	0.0029	<0.0005	**-83**	<0.0005	NA	0.0175	0.0228	30
13-Oct-21	FTG19-0.0	Soil	0.11	**8**	**7**	0.0053	0.0043	**-19**	0.0034	0.0036	6	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0087	0.0079	-9
13-Oct-21	FTG21-0.0	Soil	0.11	**64**	**50**	0.0448	0.0345	**-23**	0.0235	0.0209	**-11**	<0.0002	<0.0002	NA	0.0024	<0.0005	**-79**	<0.0005	NA	0.0707	0.0554	**-22**
13-Oct-21	FTG21-0.5	Soil	0.14	106	100	0.0689	0.0608	**-12**	0.0787	0.0795	1	<0.0002	<0.0003	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.1480	0.1400	-5
13-Oct-21	FTG21-1.0	Soil	0.1	**66**	**69**	0.0607	0.0614	1	0.0052	0.0075	44	<0.0002	<0.0003	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0659	0.0689	5
13-Oct-21	FTG40-0.0	Soil	<0.10	NA	NA	0.0011	0.0005	**-55**	<0.0002	<0.0002	NA	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0011	0.0005	**-55**
13-Oct-21	FTG41-0.0	Soil	<0.10	NA	NA	0.0169	0.0167	**-1**	0.0057	0.0119	109	<0.0002	<0.0002	NA	0.0006	<0.0005	**-17**	<0.0005	NA	0.0232	0.0286	23
15-Oct-21	SS02	Soil	<0.10	NA	NA	0.0289	0.0371	28	0.0026	0.0035	35	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0315	0.0406	29
Emergency Evacuation Area A																						
03-Nov-20	BH6-0.0-0.1	Soil	<1.0	NA	NA	0.0000	<0.0002	NA	0.0014	<0.0002	**-86**	<0.0005	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0014	<0.0002	**-86**
Callide A																						
29-Jun-22	CA15-0.0	Soil	<1.0	NA	NA	0.0066	0.0062	**-6**	<0.0005	0.0008	NA	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0033	0.0039	18
29-Jun-22	CA15-0.5	Soil	<1.0	NA	NA	0.1270	0.1433	13	0.0009	0.0269	2,889	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0655	0.1000	53
29-Jun-22	CA15-1.0	Soil	<1.0	NA	NA	0.0016	0.0026	63	<0.0005	0.0003	NA	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0008	0.0016	100
Ash Dam B																						
28-Apr-22	TP01_AD_0.5	Ash	0.94	**0**	**0**	0.0016	0	**-100**	<0.0005	<0.0005	NA	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0008	<0.0002	**-75**
28-Apr-22	TP02_AD_6.0	Ash	0.1	**2**	**1**	0.0036	0.001	**-72**	<0.0005	<0.0005	NA	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0018	0.0005	**-72**
04-Nov-20	DRD-SED	Sediment	<1.0	NA	NA	0.0156	0.0108	**-31**	<0.0005	0.0006	NA	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0078	0.0060	**-23**
Western Seepage Collection Pond																						
03-Nov-20	SW03-SED	Sediment	<1.0	NA	NA	0.0044	0.0034	**-23**	<0.0005	<0.0005	NA	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0022	0.0017	**-23**
Eastern Seepage Collection Pond																						
04-Nov-20	SW04-SED	Sediment	<1.0	NA	NA	0.0024	0.0016	**-33**	<0.0005	<0.0005	NA	<0.0002	<0.0002	NA	<0.0005	<0.0005	NA	<0.0005	NA	0.0012	0.0008	**-33**

NOTES:
1 QA Result Exceeds Adopted Criteria - Refer NEMP 2.0, Section 19.2
A <900% adopted to indicate a 'high' percentage of other PFAS through comparison of TOF and Total PFAS/TOPA analysis. Refer Section 19.2.2 of NEMP 2.0
B Sum of PFCA/PFSA post-TOP Assay should be equal to or greater than the sum of PFCA/PFSA pre-TOP Assay, which signifies any precursors being converted to PFCA products (NEMP 2.0, Section 19.2.3)
C No PFAA precursors are detectable post oxidation, signifying complete oxidation (NEMP 2.0, Section 19.2.3)
D For aqueous samples, sum of [PFAA precursors] divided by sum of [Total PFAS] <5% (NEMP 2.0, Section 19.2.3)
E Total PFAS concentration post-TOP Assay should be greater or equal to the total PFAS concentration pre-TOP Assay, noting a decrease of up to 10% might be expected due to normal analytical variability (NEMP 2.0, Section 19.2.3)

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T10: Soil Remediation and Validation Analytical Results

Sample Date	Laboratory Sample Number	Sample Number	Material Type	Analysis	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg)												Perfluoroalkyl Sulfonamides (mg/kg)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg)				Total PFAS (mg/kg)
					PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
Adopted Soil Remediation Target Criteria					-	-	-	-	-	-	**0.04**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (mg/kg) - Standard Analysis					0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0012	0.0005	0.0012	0.0012	0.0012	0.0012	0.0012	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Laboratory Level of Reporting (mg/kg) - TOPA					0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002
Fuel Oil Tanks																																		
06-Oct-22	EB2229632001	FOT-A1-V1_0.5	Soil	Standard	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0119**	<0.0002	**0.0122**	<0.001	**0.0004**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0129**
06-Oct-22	EB2229632002	FOT-A1-V1_1.0	Soil	Standard	<0.0002	<0.0002	**0.0005**	**0.0013**	**0.0917**	<0.0002	**0.0922**	<0.001	**0.0009**	**0.0005**	<0.0002	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0957**
06-Oct-22	EB2229632003	FOT-A1-V2-0.5	Soil	Standard	**0.0012**	**0.011**	**0.12**	**0.0014**	**0.0012**	<0.0002	**0.121**	**0.00**	**0.0023**	**0.0116**	**0.0012**	**0.0027**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1550**
06-Oct-22	EB2229632004	FOT-A1-V2_1.0	Soil	Standard	<0.0002	**0.0008**	**0.0882**	**0.0028**	**0.0229**	<0.0002	**0.111**	<0.001	**0.0018**	**0.0042**	**0.0008**	**0.0027**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1240**
27-Oct-22	EB2232058009	FOT-A1-V03-0.5	Soil	Standard	<0.0002	<0.0002	**0.0012**	<0.0002	**0.0198**	**0.0060**	**0.021**	**0.00**	**0.0019**	**0.0014**	**0.0009**	**0.0002**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0326**
27-Oct-22	EB2232058010	FOT-A1-V03-1.0	Soil	Standard	<0.0002	<0.0002	**0.0068**	**0.0008**	**0.02**	<0.0002	**0.0268**	<0.001	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0280**
27-Oct-22	EB2232058011	FOT-A1-V04-0.5	Soil	Standard	<0.0002	<0.0002	**0.0015**	<0.0002	**0.0147**	**0.0018**	**0.0162**	<0.001	**0.0004**	**0.0004**	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0190**
27-Oct-22	EB2232058012	FOT-A1-V04-1.0	Soil	Standard	<0.0002	<0.0002	**0.0012**	**0.0007**	**0.0369**	<0.0002	**0.0381**	<0.001	<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0390**
27-Oct-22	EB2232058013	FOT-A1-V05-0.5	Soil	Standard	<0.0002	<0.0002	**0.001**	**0.0003**	**0.0468**	**0.0012**	**0.0478**	<0.001	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0496**
27-Oct-22	EB2232058014	FOT-A1-V05-1.0	Soil	Standard	<0.0002	<0.0002	<0.0002	**0.0312**	**0.0002**	**0.0061**	**0.0312**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0314**
27-Oct-22	EB2232058015	FOT-A1-V06-0.5	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0043**	**0.0004**	**0.0043**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0047**
27-Oct-22	EB2232058016	FOT-A1-V06-1.0	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0314**	**0.0023**	**0.0314**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0337**
27-Oct-22	EB2232058017	FOT-A1-V07-0.5	Soil	Standard	<0.0002	<0.0002	**0.001**	<0.0002	**0.0147**	**0.0005**	**0.0157**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0162**
27-Oct-22	EB2232058018	FOT-A1-V07-1.0	Soil	Standard	<0.0002	<0.0002	**0.0037**	**0.0016**	**0.266**	**0.0140**	**0.27**	<0.001	<0.0002	**0.0005**	<0.0002	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.001**	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.2880**
27-Oct-22	EB2232058019	FOT-A1-V08-0.5	Soil	Standard	<0.0002	<0.0002	**0.0003**	**0.0006**	**0.0795**	<0.0002	**0.0798**	<0.001	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0807**
27-Oct-22	EB2232058020	FOT-A1-V09-0.5	Soil	Standard	<0.0010	<0.0010	<0.0010	<0.0010	**0.561**	<0.0010	**0.561**	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0024	**0.0028**	<0.0024	<0.0024	<0.0024	<0.0024	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.5640**
27-Oct-22	EB2232058021	FOT-A1-V10-0.5	Soil	Standard	<0.0005	<0.0005	**0.0014**	<0.0005	**0.341**	<0.0005	**0.342**	<0.002	**0.0007**	**0.0041**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	**0.0007**	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.3480**
27-Oct-22	EB2232058022	FOT-A1-V11-0.5	Soil	Standard	<0.0002	**0.0002**	**0.0036**	<0.0002	**0.0404**	**0.0061**	**0.044**	<0.001	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	**0.0004**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0510**
27-Oct-22	EB2232058023	FOT-A1-V11-1.0	Soil	Standard	<0.0010	**0.0042**	**0.0697**	**0.0064**	**0.712**	**0.0049**	**0.782**	<0.005	**0.0028**	**0.0157**	**0.0015**	**0.0034**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.8210**
27-Oct-22	EB2232058024	FOT-A1-V12-0.5	Soil	Standard	**0.0002**	**0.0002**	**0.0037**	**0.0002**	**0.0417**	**0.0395**	**0.0454**	<0.001	<0.0002	**0.0008**	<0.0002	**0.0003**	<0.0002	**0.0003**	**0.0012**	**0.0046**	<0.0005	<0.0005	**0.0016**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0943**
27-Oct-22	EB2232058025	FOT-A1-V12-1.0	Soil	Standard	<0.0025	<0.0025	**0.0214**	<0.0025	**1.84**	**0.0128**	**1.85**	<0.012	<0.0025	**0.0175**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0062	<0.0025	<0.0062	<0.0062	<0.0062	<0.0062	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	**1.8900**
27-Oct-22	EB2232058026	FOT-A1-V13-0.5	Soil	Standard	<0.0002	<0.0002	**0.0035**	**0.0025**	**0.0898**	**0.0009**	**0.0933**	<0.001	<0.0002	**0.0002**	<0.0002	**0.002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0989**
06-Oct-22	EB2229632005	FOT-A2-V1_0.5	Soil	Standard	<0.0010	**0.0023**	**0.15**	**0.0106**	**0.791**	<0.0010	**0.941**	<0.005	**0.0013**	**0.0106**	**0.0032**	**0.0148**	**0.0015**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0024	<0.0010	<0.0024	<0.0024	<0.0024	<0.0024	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.9850**
06-Oct-22	EB2229632006	FOT-A2-V1_1.0	Soil	Standard	<0.0005	**0.0009**	**0.0668**	**0.0033**	**0.544**	<0.0005	**0.611**	<0.002	<0.0005	**0.0029**	**0.0009**	**0.0073**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	**0.0016**	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.6280**
06-Oct-22	EB2229633007	FOT-A2-V2_0.5	Soil	Standard	<0.0002	<0.0002	**0.0081**	**0.0004**	**0.0985**	**0.0032**	**0.107**	<0.001	**0.0005**	**0.0003**	**0.0006**	**0.0004**	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1130**
06-Oct-22	EB2229632008	FOT-A2-V2_1.0	Soil	Standard	<0.0010	<0.0010	**0.004**	<0.0010	**0.586**	<0.0018	**0.59**	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0024	<0.0010	<0.0024	<0.0024	<0.0024	<0.0024	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.5900**
06-Oct-22	EB2229632009	FOT-A2-V3_0.5	Soil	Standard	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0115**	**0.0029**	**0.0119**	<0.001	**0.0003**	**0.0004**	**0.0003**	**0.0002**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0162**
06-Oct-22	EB2229632010	FOT-A2-V3_1.0	Soil	Standard	<0.0002	<0.0002	**0.0029**	**0.0002**	**0.104**	**0.0070**	**0.107**	<0.001	**0.0005**	**0.0006**	**0.0003**	**0.0002**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0011**	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1170**
06-Oct-22	EB2229632011	FOT-A2-V4_0.5	Soil	Standard	<0.0010	<0.0010	**0.0016**	<0.0010	**0.418**	<0.0010	**0.42**	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	**0.0021**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.4220**
06-Oct-22	EB2229632012	FOT-A2-V4_1.0	Soil	Standard	<0.0025	<0.0025	**0.0084**	**0.0034**	**1.94**	<0.0105	**1.95**	<0.012	<0.0025	**0.0076**	<0.0025	**0.0029**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0062	**0.0159**	<0.0062	<0.0062	<0.0062	<0.0062	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	**1.9800**
06-Oct-22	EB2229632013	FOT-A2-V5_0.5	Soil	Standard	<0.0024	<0.0024	**0.0112**	**0.0029**	**1.48**	<0.0042	**1.49**	<0.012	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0061	**0.0058**	<0.0061	<0.0061	<0.0061	<0.0061	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	**1.5000**
06-Oct-22	EB2229632014	FOT-A2-V5_1.0	Soil	Standard	<0.0024	<0.0024	**0.0213**	**0.0098**	**2.08**	**0.0092**	**2.1**	<0.012	<0.0024	**0.0063**	<0.0024	**0.0071**	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0061	**0.0124**	<0.0061	<0.0061	<0.0061	<0.0061	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	<0.0024	**2.1500**
06-Oct-22	EB2229632015	FOT-A2-V6_0.5	Soil	Standard	<0.0002	**0.0003**	**0.0124**	**0.008**	**0.0427**	<0.0002	**0.0551**	<0.001	**0.0002**	**0.0007**	**0.0071**	**0.0075**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0789**
06-Oct-22	EB2229632016	FOT-A2-V6_1.0	Soil	Standard	<0.0002	**0.0004**	**0.0108**	**0.002**	**0.0063**	<0.0002	**0.0171**	<0.001	<0.0002	**0.0009**	**0.0020**	**0.0026**	**0.0043**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0293**
06-Oct-22	EB2229632017	FOT-A2-V7_0.5	Soil	Standard	<0.0002	<0.0002	**0.0004**	<0.0002	**0.189**	<0.0002	**0.189**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1890**
06-Oct-22	EB2229632018	FOT-A2-V7_1.0	Soil	Standard	<0.0002	<0.0002	**0.0012**	**0.0008**	**0.16**	<0.0002	**0.161**	<0.001	<0.0002	<0.0002	<0.0002	**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1620**
06-Oct-22	EB2229632019	FOT-A2-V8_0.5	Soil	Standard	<0.0002	<0.0002	**0.0004**	<0.0002	**0.166**	<0.0002	**0.166**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1660**
06-Oct-22	EB2229632020	FOT-A2-V8_1.0	Soil	Standard	<0.0002	<0.0002	**0.0018**	<0.0002	**0.0792**	<0.0002	**0.081**	<0.001	**0.0003**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0816**
06-Oct-22	EB2229632021	FOT-A2-V9_0.5	Soil	Standard	<0.0002	<0.0002	**0.0136**	**0.003**	**0.175**	<0.0002	**0.189**	<0.001	**0.0008**	**0.0009**	**0.0008**	**0.0026**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1970**
06-Oct-22	EB2229632022	FOT-A2-V9_1.0	Soil	Standard	**0.0011**	**0.003**	**0.205**	**0.0093**	**0.244**	<0.0002	**0.449**	<0.001	**0.0018**	**0.0014**	**0.0013**	**0.0115**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.4780**
06-Oct-22	EB2229632023	FOT-A2-V10_0.5	Soil	Standard	<0.0002	**0.0003**	**0.0453**	**0.0028**	**0.0551**	<0.0002	**0.1**	<0.001	**0.0004**	**0.0009**	**0.0004**	**0.0027**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.1080**
06-Oct-22	EB2229632024	FOT-A2-V10_1.0	Soil	Standard	**0.0003**	**0.0016**	**0.0198**	<0.0002	**0.0016**	<0.0002	**0.0214**	<0.001	**0.0003**	**0.0020**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0258**
06-Oct-22	EB2229632025	FOT-A2-V11_0.5	Soil	Standard	<0.0010	<0.0010	**0.0231**	**0.0101**	**0.714**	<0.0010	**0.737**	<0.005	<0.0010	<0.0010	<0.0010	**0.0037**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.7510**
06-Oct-22	EB2229632026	FOT-A2-V11_1.0	Soil	Standard	<0.0005	**0.0014**	**0.0356**	**0.0154**	**0.469**	<0.0005	**0.505**	<0.002	<0.0005	**0.0024**	<0.0005	**0.0108**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0005	<0.0013	<0.0013	<0.0013	<0.0013	<0.0005	<0.0005	<0.0005	**0.0007**	<0.0005	<0.0005	<0.0005	**0.5350**
06-Oct-22	EB2229632027	FOT-A2-V12_0.5	Soil	Standard	**0.0843**	**0.0866**	**0.681**	**0.0136**	**0.243**	<0.0010	**0.924**	**0.03**	**0.0425**	**0.1950**	**0.0114**	**0.0225**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0024	<0.0010	<0.0024	<0.0024	<0.0024	<0.0024	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**1.3200**
06-Oct-22	EB2229632028	FOT-A2-V12_1.0	Soil	Standard	**0.0872**	**0.152**	**0.383**	**0.0069**	**0.0066**	<0.0005	**0.39**	**0.01**	**0.0231**	**0.1360**	**0.0128**	**0.003**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.8130**
06-Oct-22	EB2229632029	FOT-A2-V13_0.5	Soil	Standard	<0.0025	<0.0025	**0.248**	**0.0907**	**1.74**	<0.0025	**1.99**	<0.012	<0.0025	**0.0043**	<0.0025	**0.0618**	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0063	<0.0025	<0.0063	<0.0063	<0.0063	<0.0063	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	**2.1400**
06-Oct-22	EB2229632030	FOT-A2-V13_1.0	Soil	Standard	<0.0010	**0.0049**	**0.216**	**0.0834**	**0.306**	<0.0005	**0.522**	<0.002	**0.0005**	**0.0137**	**0.0006**	**0.108**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.7330**
27-Oct-22	EB2232058028	FOT-A3-V01-0.5	Soil	Standard	<0.0002	<0.0002	<0.0002	**0.0132**	<0.0002	**0.0132**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0132**
27-Oct-22	EB2232058029	FOT-A3-V01-1.0	Soil	Standard	<0.0002	<0.0002	<0.0002	**0.0121**	<0.0002	**0.0121**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0121**
27-Oct-22	EB2232058030	FOT-A3-V02-0.5	Soil	Standard	<0.0002	<0.0002	**0.0038**	**0.0003**	**0.0085**	<0.0002	**0.0123**	<0.001	<0.0002	**0.0003**	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0132**
27-Oct-22	EB2232058031	FOT-A3-V02-1.0	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0018**	<0.0002	**0.0018**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0018**
27-Oct-22	EB2232058032	FOT-A3-V03-0.5	Soil	Standard	<0.0002	<0.0002	**0.0019**	**0.0002**	**0.0444**	<0.0002	**0.0463**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0467**
27-Oct-22	EB2232058033	FOT-A3-V03-1.0	Soil	Standard	<0.0002	<0.0002	**0.0008**	<0.0002	**0.0173**	**0.0008**	**0.0181**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0189**
27-Oct-22	EB2232058034	FOT-A3-V04-0.5	Soil	Standard	<0.0002	<0.0002	**0.0009**	**0.0004**	**0.0488**	**0.0006**	**0.0497**	<0.001	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0510**
27-Oct-22	EB2232058035	FOT-A3-V04-1.0	Soil	Standard	<0.0002	<0.0002	**0.0006**	**0.0005**	**0.0162**	<0.0002	**0.0168**	<0.001	<0.0002	<0.0002	<0.0002	**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0178**
27-Oct-22	EB2232058036	FOT-A3-V05-0.5	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0445**	<0.0002	**0.0445**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0445**
27-Oct-22	EB2232058037	FOT-A3-V05-1.0	Soil	Standard	<0.0

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T10: Soil Remediation and Validation Analytical Results

Sample Date	Laboratory Sample Number	Sample Number	Material Type	Analysis	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg)												Perfluoroalkyl Sulfonamides (mg/kg)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg)				Total PFAS (mg/kg)
					PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
Adopted Soil Remediation Target Criteria					-	-	-	-	-	-	**0.04**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (mg/kg) - Standard Analysis					0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0012	0.0005	0.0012	0.0012	0.0012	0.0012	0.0012	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Laboratory Level of Reporting (mg/kg) - TOPA					0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0005	0.0002	0.0005	0.0002	0.0002
28-Oct-22	EB2232058076	FTG-A2-B4B	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0055**	<0.0002	**0.0055**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0055**
04-Oct-22	EB2229597043	FTG-A2-V5_0.5	Soil	Standard	**0.0004**	**0.0006**	**0.0098**	<0.0002	**0.0006**	<0.0002	**0.0104**	<0.001	**0.0005**	**0.0016**	**0.0008**	**0.0021**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0164**
04-Oct-22	EB2229597044	FTG-A2-V5_1.0	Soil	Standard	**0.0002**	<0.0002	**0.0004**	<0.0002	**0.0002**	<0.0002	**0.0006**	<0.001	<0.0002	<0.0002	**0.0007**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0015**
04-Oct-22	EB2229597045	FTG-A2-B5	Soil	Standard	<0.0002	<0.0002	**0.004**	**0.0004**	**0.001**	<0.0002	**0.005**	<0.001	**0.0002**	**0.0006**	**0.0006**	**0.0012**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0080**
04-Oct-22	EB2229597046	FTG-A2-V6_0.5	Soil	Standard	<0.0002	<0.0002	**0.0003**	<0.0002	**0.029**	<0.0002	**0.0293**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0296**
04-Oct-22	EB2229597047	FTG-A2-V6_1.0	Soil	Standard	<0.0002	<0.0002	**0.0005**	**0.0004**	**0.0409**	<0.0002	**0.0414**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0006**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0427**
28-Oct-22	EB2232058085	FTG-A2-V6A-0.5	Soil	Standard	<0.0002	<0.0002	**0.0002**	<0.0002	**0.008**	<0.0002	**0.0082**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0082**
28-Oct-22	EB2232058086	FTG-A2-V6A-1.0	Soil	Standard	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0145**	**0.0005**	**0.015**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0162**
28-Oct-22	EB2232058087	FTG-A2-V6B-0.5	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.01**	<0.0002	**0.01**	<0.001	**0.0002**	**0.0002**	<0.0002	**0.0003**	**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0112**
28-Oct-22	EB2232058088	FTG-A2-V6B-1.0	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0051**	**0.0003**	**0.0051**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0058**
28-Oct-22	EB2232058089	FTG-A2-V6C-0.5	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0071**	**0.0006**	**0.0071**	<0.001	<0.0002	**0.0005**	**0.0005**	**0.0003**	**0.0003**	**0.0007**	**0.0004**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0107**
28-Oct-22	EB2232058090	FTG-A2-V6C-1.0	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0065**	**0.0004**	**0.0065**	<0.001	<0.0002	**0.0004**	**0.0003**	**0.0003**	**0.0003**	**0.0008**	**0.0004**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0097**
04-Oct-22	EB2229597048	FTG-A2-B6	Soil	Standard	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0042**	<0.0002	**0.0044**	<0.001	<0.0002	<0.0002	**0.0002**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0049**
28-Oct-22	EB2232058077	FTG-A2-B6A	Soil	Standard	**0.0002**	**0.0004**	**0.0028**	**0.0008**	**0.0134**	<0.0002	**0.0162**	<0.001	**0.0003**	**0.0013**	**0.0005**	**0.0007**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	**0.0010**	<0.0005	<0.0005	**0.0214**
28-Oct-22	EB2232058078	FTG-A2-B6C	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0046**	<0.0002	**0.0046**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0046**
04-Oct-22	EB2229597049	FTG-A2-V7_0.5	Soil	Standard	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0094**	**0.0032**	**0.0097**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0006**	**0.0008**	**0.0003**	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0146**
04-Oct-22	EB2229597050	FTG-A2-V7_1.0	Soil	Standard	<0.0002	<0.0002	**0.0006**	**0.0003**	**0.0458**	**0.0003**	**0.0464**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0005**	**0.0012**	**0.0004**	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	**0.0006**	<0.0005	<0.0005	**0.0497**
28-Oct-22	EB2232058091	FTG-A2-V7A-0.5	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0056**	<0.0002	**0.0056**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0056**
28-Oct-22	EB2232058092	FTG-A2-V7A-1.0	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0047**	**0.0002**	**0.0047**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**	**0.0002**	**0.0002**	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0056**
04-Oct-22	EB2229597051	FTG-A2-B7	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0079**	<0.0002	**0.0079**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**	**0.0008**	**0.0004**	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0094**
04-Oct-22	EB2229597052	FTG-A2-V8_0.5	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0024**	<0.0002	**0.0024**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0027**
04-Oct-22	EB2229597053	FTG-A2-V8_1.0	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002	**0.0004**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0004**
04-Oct-22	EB2229597054	FTG-A2-B8	Soil	Standard	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0267**	**0.0011**	**0.0273**	<0.001	**0.0002**	**0.0002**	**0.0003**	**0.0008**	**0.0012**	**0.0007**	**0.0006**	**0.0004**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	**0.0012**	<0.0005	<0.0005	**0.0049**
04-Oct-22	EB2229597057	FTG-A2-B9	Soil	Standard	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0091**	<0.0002	**0.0093**	<0.001	**0.0007**	**0.0004**	**0.0006**	**0.0012**	**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	**0.0028**	<0.0005	<0.0005	**0.0155**
04-Oct-22	EB2229597060	FTG-A2-B10	Soil	Standard	<0.0002	<0.0002	**0.0008**	<0.0002	**0.0204**	<0.0002	**0.0212**	<0.001	**0.0007**	**0.0005**	**0.001**	**0.001**	**0.0005**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	**0.0009**	**0.0020**	<0.0005	**0.0280**
04-Oct-22	EB2229597061	FTG-A3-V1	Soil	Standard	<0.0002	<0.0002	**0.0014**	<0.0002	**0.0066**	**0.0028**	**0.008**	<0.001	**0.0013**	**0.0008**	**0.0013**	**0.0008**	**0.0007**	**0.0004**	**0.0008**	**0.0003**	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0172**
04-Oct-22	EB2229597062	FTG-A3-B1	Soil	Standard	**0.0007**	**0.0019**	**0.0116**	**0.0006**	**0.021**	**0.0071**	**0.0236**	<0.001	**0.0015**	**0.0030**	**0.0033**	**0.0052**	**0.0019**	**0.0018**	**0.0023**	**0.0007**	<0.0005	**0.0008**	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	**0.0009**	**0.0049**	**0.0026**	**0.0761**
04-Oct-22	EB2229597063	FTG-A3-V2	Soil	Standard	**0.0002**	**0.0004**	**0.003**	<0.0002	**0.0119**	**0.0003**	**0.0149**	<0.001	**0.0007**	**0.0005**	**0.0025**	**0.0009**	**0.0007**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	**0.0006**	<0.0005	**0.0217**
04-Oct-22	EB2229597064	FTG-A3-B2	Soil	Standard	<0.0002	<0.0002	**0.0014**	<0.0002	**0.0116**	**0.0005**	**0.013**	<0.001	**0.0004**	**0.0004**	**0.0012**	**0.0006**	**0.0006**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	**0.0020**	<0.0005	**0.0189**
04-Oct-22	EB2229597065	FTG-A3-V3	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0036**	<0.0002	**0.0036**	<0.001	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0038**
04-Oct-22	EB2229597066	FTG-A3-B3	Soil	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0058**	<0.0002	**0.0058**	<0.001	<0.0002	<0.0002	**0.0003**	**0.0002**	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0065**
04-Oct-22	EB2229597067	FTG-A3-V4	Soil	Standard	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0299**	**0.0010**	**0.0301**	<0.001	**0.0002**	**0.0003**	**0.0004**	**0.0005**	**0.0006**	**0.0009**	**0.0003**	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0343**
Fire Training Ground (FTG) - August 2023																																		
22-Aug-23	B23-Au0060052	FTG-A1-B1	Soil	Standard	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.01	<0.005	<0.005	<0.05
22-Aug-23	B23-Au0060053	FTG-A1-B2	Soil	Standard	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.01	<0.005	<0.005	<0.05
22-Aug-23	B23-Au0060054	FTG-A1-B3	Soil	Standard	<0.005	<0.005	**0.0052**	<0.005	**0.15**	<0.005	**0.1552**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	**0.0280**	<0.005	<0.005	**0.1832**
22-Aug-23	B23-Au0060055	FTG-A1-B4	Soil	Standard	<0.005	<0.005	**0.035**	<0.005	**0.058**	<0.005	**0.093**	<0.005	<0.005	<0.005	**0.0079**	<0.005	**0.016**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	**0.1200**	<0.005	<0.005	**0.2369**
22-Aug-23	B23-Au0060056	FTG-A1-B5	Soil	Standard	<0.005	<0.005	**0.0057**	<0.005	**0.014**	<0.005	**0.0197**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.01	<0.005	<0.005	<0.05
22-Aug-23	B23-Au0060057	FTG-A1-B6	Soil	Standard	<0.005	<0.005	**0.01**	<0.005	**0.035**	<0.005	**0.045**	<0.005	<0.005	<0.005	**0.0093**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.01	<0.005	<0.005	**0.0543**
Fire Training Ground (FTG) - Oversized Rock																																		
04-Oct-22	EB2229597001	FTG-A2-R1	Oversized Rock - Type 1	Standard	<0.0002	<0.0002	**0.0026**	**0.0003**	**0.027**	<0.0002	**0.0296**	<0.001	<0.0002	**0.0002**	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0303**
04-Oct-22	EB2229597002	FTG-A2-R2	Oversized Rock - Type 2	Standard	<0.0010	<0.0010	**0.0753**	**0.0066**	**0.667**	<0.0010	**0.742**	<0.005	<0.0010	**0.0016**	<0.0010	**0.0018**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.752**
04-Oct-22	EB2229597003	FTG-A2-R3	Oversized Rock - Type 3	Standard	<0.0002	<0.0002	**0.0024**	**0.0003**	**0.0371**	<0.0002	**0.0395**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0398**
04-Oct-22	EB2229597004	FTG-A2-R4	Oversized Rock - Type 4	Standard	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0036**	<0.0002	**0.0038**	<0.001	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0042**
04-Oct-22	EB2229597005	FTG-A2-R5	Oversized Rock - Type 1	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0025**	<0.0002	**0.0025**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0025**
04-Oct-22	EB2229597006	FTG-A2-R6	Oversized Rock - Type 2	Standard	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0024**	<0.0002	**0.0026**	<0.001	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0028**
04-Oct-22	EB2229597007	FTG-A2-R7	Oversized Rock - Type 4	Standard	<0.0002	<0.0002	**0.0003**	<0.0002	**0.0029**	<0.0002	**0.0032**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	**0.0009**	<0.0005	**0.0041**
04-Oct-22	EB2229597008	FTG-A2-R8	Oversized Rock - Type 3	Standard	<0.0002	<0.0002	**0.0026**	**0.0002**	**0.0243**	<0.0002	**0.0269**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0271**
04-Oct-22	EB2229597009	FTG-A2-R9	Oversized Rock - Type 4	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0016**	<0.0002	**0.0016**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	**0.0006**	<0.0005	**0.0022**
04-Oct-22	EB2229597010	FTG-A2-R10	Oversized Rock - Type 1	Standard	<0.0002	<0.0002	**0.0009**	<0.0002	**0.0078**	<0.0002	**0.0087**	<0.001	**0.0021**	**0.0018**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0129**
Fire Training Ground (FTG) - Concrete																																		
03-Jul-23	EB2320334001	CC01	Concrete	Standard	**0.0233**	**0.0164**	**0.0263**	**0.0006**	**0.015**	<0.0002	**0.0413**	**0.02**	**0.0354**	**0.1870**	**0.0391**	**0.0121**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	**0.0042**	**0.1330**	**0.0083**	<0.0005	**0.5160**
03-Jul-23	EB2320334002	CC02	Concrete	Standard	**0.0558**	**0.0579**	**0.221**	**0.0114**	**0.324**	<0.0005	**0.5450**	**0.02**	**0.0425**	**0.3080**	**0.051**	**0.0456**	**0.0015**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	**0.0008**	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	**0.0006**	**0.1330**	**0.0160**	**0.0045**	**1.2900**
03-Jul-23	EB2320334003	CC03	Concrete	Standard	**0.0233**	**0.0195**	**0.0532**	**0.0012**	**0.0199**	<0.0002	**0.0731**	**0.02**	**0.0296**	**0.1460**	**0.0284**	**0.0231**	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	**0.0010**	**0.1590**	**0.0108**	**0.0007**	**0.5320**
03-Jul-23	EB2320334004	CC04	Concrete	Standard	**0.0157**	**0.0159**	**0.0838**	**0.0094**	**0.209**	<0.0002	**0.293**	**0.01**	**0.0114**	**0.0662**	**0.0161**	**0.0279**	**0.0011**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0006	**0.0006**	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	**0.0005**	**0.1280**	**0.0135**	**0.0016**	**0.6090**

NOTES:
1 Analyte exceeds the Adopted Soil Remediation Target Criteria
\- Not analysed

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date: Mar-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T11: Soil Remediation and Validation Analytical Results - Leachate

Sample Date	Laboratory Sample Number	Sample Number	Material Type	Analysis	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)							Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)											Perfluoroalkyl Sulfonamides (µg/L)							Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)
					PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)					-	-	-	-	**0.00023**	-	-	-	-	-	-	**19**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)					-	-	-	-	**0.13**	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water					-	-	**0.07**	-	**0.07**	-	**0.07**	-	-	-	-	**0.56**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water					-	-	**0.7**	-	**0.7**	-	**0.7**	-	-	-	-	**5.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ERA 60 Waste Disposal - Allowable Leaching Level - Double Lined Landfill					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**50.00**
Adopted Soil Remediation Target Criteria					-	-	-	-	-	-	**1.40**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L)) - Standard Analysis					0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005
Fire Training Ground (FTG) - Concrete																																		
12-Oct-21	EB2129941088	Concrete Core 10	Concrete	Leachate (ASLP)	**0.8730**	**0.712**	**2.87**	**0.218**	**4.5**	<0.0299	**7.37**	**0.64**	**0.879**	**3.53**	**0.598**	**0.858**	<0.0299	<0.0299	<0.0299	<0.0299	<0.0299	<0.0748	**0.0299**	<0.075	<0.075	<0.075	<0.075	<0.0299	<0.0299	<0.030	**2.75**	**0.299**	<0.030	**18.8**
12-Oct-21	EB2129941089	Concrete Core 11	Concrete	Leachate (ASLP)	**1.9800**	**0.777**	**1.11**	**0.0168**	**0.113**	<0.0153	**1.22**	**1.01**	**1.44**	**7.14**	**0.878**	**0.475**	**0.0214**	<0.0153	<0.0153	<0.0153	<0.0153	<0.0382	<0.0153	<0.038	<0.038	<0.038	<0.038	<0.0153	<0.0153	**0.0380**	**5.29**	**0.504**	<0.015	**20.8**
12-Oct-21	EB2129941090	Concrete Core 12	Concrete	Leachate (ASLP)	**0.0937**	**0.0167**	**0.0264**	**0.0014**	**0.0245**	<0.0005	**0.0509**	**0.07**	**0.0988**	**0.613**	**0.0985**	**0.0132**	**0.0015**	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	**0.0020**	**0.171**	**0.031**	<0.001	**1.26**
03-Jul-23	EB2320334001	CC01	Concrete	Leachate (TCLP)	**0.693**	**0.324**	**0.524**	**0.0079**	**0.0858**	<0.0079	**0.61**	**0.597**	**1.24**	**5.2**	**1.13**	**0.302**	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0197	<0.0079	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	**0.12**	**4.5**	**0.069**	<0.008	**14.8**
03-Jul-23	EB2320334002	CC02	Concrete	Leachate (TCLP)	**1.5**	**0.966**	**3.77**	**0.226**	**4.2**	<0.0080	**7.97**	**0.666**	**1.16**	**5**	**0.806**	**0.966**	**0.0296**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0200	**0.0136**	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	**0.014**	**3.2**	**0.167**	<0.008	**22.7**
03-Jul-23	EB2320334003	CC03	Concrete	Leachate (TCLP)	**1.2**	**0.69**	**1.75**	**0.0349**	**0.314**	<0.0079	**2.06**	**0.937**	**1.71**	**6.86**	**1.12**	**0.667**	**0.0143**	<0.0079	<0.0079	<0.0079	<0.0079	<0.0198	<0.0079	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	**0.052**	**5.29**	**0.085**	<0.008	**20.7**
03-Jul-23	EB2320334004	CC04	Concrete	Leachate (TCLP)	**0.578**	**0.528**	**3.29**	**0.326**	**5.16**	<0.0079	**8.45**	**0.3**	**0.449**	**2.54**	**0.783**	**1.09**	**0.0443**	**0.0111**	<0.0079	<0.0079	<0.0079	<0.0198	**0.0158**	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	**0.017**	**6.78**	**0.29**	<0.008	**22.2**
Fire Training Ground (FTG) - Soil																																		
29-Aug-23	B23-Au0078653	FTG-A1-B3A	Soil	Leachate (ASLP)	**0.0360**	**0.029**	**0.044**	**0.001**	**0.034**	< 0.001	**0.078**	**0.0340**	**0.069**	**0.1900**	**0.03**	**0.016**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	**0.0370**	**0.0030**	< 0.001	**0.5380**
29-Aug-23	B23-Au0078654	FTG-A1-B4A	Soil	Leachate (ASLP)	**0.0780**	**0.049**	**0.044**	< 0.001	**0.088**	< 0.001	**0.052**	**0.0650**	**0.12**	**0.2500**	**0.022**	**0.01**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	**0.0190**	< 0.001	< 0.001	**0.7030**
Post-Treatment Validation																																		
04-Nov-22	B22-De0017155	FOT A1 SP1 TREATED EPIC	Treated Soil	Leachate (ASLP)	< 0.01	< 0.01	< 0.01	< 0.01	**0.06**	< 0.01	**0.06**	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	**0.0600**
04-Nov-22	B22-De0017156	FOT A1 SP2 TREATED EPIC	Treated Soil	Leachate (ASLP)	< 0.01	< 0.01	< 0.01	< 0.01	**0.09**	< 0.01	**0.09**	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	**0.0900**
04-Nov-22	B22-De0017157	FOT A1 SP5 TREATED EPIC	Treated Soil	Leachate (ASLP)	< 0.01	< 0.01	< 0.01	< 0.01	**0.09**	< 0.01	**0.09**	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	**0.0900**

NOTES:

1	Analyte exceeds the PFAS NEMP Freshwater 99% Species Protection Limit
1	Analyte exceeds the PFAS NEMP Freshwater 95% Species Protection Limit
1	Analyte exceeds the PFAS NEMP Health Based - Drinking Water Criteria
1	Analyte exceeds the PFAS NEMP Health Based - Recreational Water Criteria
1	Analyte exceeds the ERA60 Double Lined Landfill Criteria
1	Analyte exceeds the Adopted Soil Remediation Target Criteria

APPENDIX A SQP DOCUMENTATION

Suitably qualified person declaration

In accordance with section 566 of the Environmental Protection Act 1994 *(EP Act), a suitably qualified person (SQP) must provide the administering authority with a declaration to accompany a document prepared by the SQP in relation to a regulatory function. Section 564 states that a regulatory function to be performed by an SQP means:*

- *conducting a site investigation to prepare a site investigation report*
- *preparing a validation report*
- *preparing a draft SMP or a draft amended SMP.*

A contaminated land investigation document, which needs to be prepared in accordance with section 389, can comprise any of the above documents or a combination of these.

This template is for use by a SQP to make a declaration under section 566 of the EP Act, which must accompany a contaminated land investigation document submitted to the administering authority.

1. Suitably qualified person (SQP) details

FULL NAME Luke Amies	
COMPANY Epic Environmental Pty Ltd	
REGISTERED ADDRESS 17/95 North Quay, Brisbane QLD	POSTCODE 4000
TELEPHONE 1800 779 363	
EMAIL lamies@epicenvironmental.com.au	
POSTAL ADDRESS (WRITE 'AS ABOVE' IF THE SAME AS REGISTERED ADDRESS) As Above	POSTCODE
PRESCRIBED ORGANISATION (IN ACCORDANCE WITH SCHEDULE 14 OF ENVIRONMENTAL PROTECTION REGULATION 2019) OF WHICH I AM A MEMBER: Environment Institute Of Australia And New Zealand	

2. SQP's role in preparing the contaminated land investigation document

☒ I am the suitably qualified person who prepared the contaminated land investigation document OR

☐ I am a suitably qualified person who prepared specific components of the contaminated land investigation document. (Provide details below)

The contaminated land investigation document is comprised of:

☒ Site investigation report

☐ Validation Report

☐ Draft SMP

☐ Draft amended SMP

Queensland Government

DETAILS OF THE CONTAMINATED LAND INVESTIGATION DOCUMENT (OR PART(S) THEREOF) THAT I PREPARED:

Callide Power Station - Addendum Contaminated Land Investigaiton Document (Site Investigation), 8 March 2024, Revision 0

e.g. Title, date, version and where appropriate chapter, section

3. Declaration

I do solemnly and sincerely declare that:

- I have the following qualification(s) relevant to work I have completed for the contaminated land investigation document:

Identified knowledge area required	Name of degree or post graduate qualifications (and major discipline of study if relevant)	Institution conferring the degree	Year of completion
Bachelor Degree	BEnvSc	University of Queensland	2003

- I have the following experience relevant to the work I have completed for the contaminated land investigation document

Identified knowledge area required	DETAILS OF PAST PROJECTS DEMONSTRATING EXPERIENCE IN THE IDENTIFIED KNOWLEDGE AREA					
	Nature of hazardous contaminant / notifiable activity	Site details		Role in project	Date finalised	Regulatory function under Ch. 7, Pt 8 of the EP Act (if applicable)
		Lot and Plan reference	State			
- Soil sampling - Site Investigation - Groundwater	NA 7 - Chemical Storage NA 29 - Petroleum Product or Oil Storage Hazardous Contaminant - PFAS, TRH, BTEXN, MBAS	Lots 1 DP582467, 5 DP1186727, 5 RP839952, 1 RP225692	QLD	- Sampling design - Fieldwork supervision - Reporting	2017	- Site Investigation
- Soil science - Environmental chemistry - Soil sampling - Groundwater sampling	NA 32 - Railway Yards Hazardous Contaminant (PAH, BaP, As, Cd, Pb, TRH, PFOS, PFHxS, asbestos)	61 SP188566, 63-65 SP312152, 64 SP312152	QLD	- Sampling design - Fieldwork supervision - Reporting	2018 - 2019	- Site Investigation - Validation Report - Site Management Plan
- Soil sampling - Site Investigation - Groundwater - Surface Water - Landfill Gas	NA 20 – Landfill Hazardous Contaminant - PFAS, TRH, BTEXN, Metals, PAH, Ammonia	268 SP103913, Lot 227 SP103913	QLD	- Sampling design - Soil/groundwater sampling - Fieldwork supervision - Reporting	2019 - 2021	- Site Investigation - CLID (investigation)
- Soil sampling - Site Investigation - Groundwater	NA 20 – Landfill Hazardous Contaminant - PFAS, TRH,	31 SP184383	QLD	- Sampling design - Soil/groundwater sampling - Fieldwork	2018 - 2023	- Site Investigation - CLID (investigation)

Identified knowledge area required	DETAILS OF PAST PROJECTS DEMONSTRATING EXPERIENCE IN THE IDENTIFIED KNOWLEDGE AREA					
	Nature of hazardous contaminant / notifiable activity	Site details		Role in project	Date finalised	Regulatory function under Ch. 7, Pt 8 of the EP Act (if applicable)
		Lot and Plan reference	State			
- Surface Water - Landfill Gas	BTEXN, Metals, PAH, Ammonia			supervision - Reporting		

- I have not knowingly included false, misleading or incomplete information in the document.
- I have not knowingly failed to reveal any relevant information or document to the administering authority.
- The contaminated land investigation document (or part thereof which I have prepared) addresses the relevant matters for the function and is factually correct.
- The opinions expressed within the contaminated land investigation document (or part thereof which I have prepared) are honestly and reasonably held.

SQP'S NAME: Luke Amies
COMPANY: Epic Environmental Pty Ltd
SQP'S SIGNATURE: 
DATE: 08.03.2024

The CEnvP Scheme Certification Board hereby attests that

Luke Amies

having fulfilled all the requirements of the Board has been certified as a

Certified Environmental Practitioner

with Registration Number

1198

on the date

06-Sep-2018

Chairperson of the Board

30/06/2025

Certification Expiry Date

The CEnvP Scheme Certification Board hereby attests that

Luke Amies

having fulfilled all the requirements of the Board has been certified as a

Certified Environmental Practitioner Site Contamination Specialist

with Registration Number

SC41090

on the date

06-Sep-2018

Chairperson of the Board

30/06/2025

Certification Expiry Date

CENVP - An Initiative of the Environment Institute of Australia and New Zealand.

APPENDIX B EE NOTICE

Notice

Environmental Protection Act 1994

Environmental Evaluation

Notice to conduct or commission an environmental evaluation

This notice to conduct or commission an environmental evaluation is issued by the administering authority pursuant to section 326B of the Environmental Protection Act 1994*.*

CS Energy Limited
Level 2, HQ (North Tower) 540 Wickham Street
FORTITUDE VALLEY QLD 4006

Your reference: EPPR00536313 | C-CPLRC-100046232 | E-100046349

Wednesday, 15 December 2021

Take notice: that under the *Environmental Protection Act 1994* (the Act) a notice to conduct or commission an environmental investigation is issued to CS Energy Limited (you) (CS Energy) by the administering authority. The administering authority is the Chief Executive of the Department of Environment and Science (the department).

The notice to conduct or commission an environmental investigation is issued in respect of the activities of CS Energy on land described as Lot 1/RP615528 and Lot 4/SP103557 (the premises).

A. Grounds

The notice to conduct or commission an environmental investigation is issued on the following grounds:

1. Under section 326BA of the Act, the department is satisfied on reasonable grounds that:
   (a) particulars of the land are recorded in the environmental management register or contaminated land register,
   (b) the hazardous contaminant contaminating the land is in a concentration that has the potential to cause serious environmental harm or material environmental harm,
   (c) a person, animal or another part of the environment may be exposed to the hazardous contaminant, whether on the land or not.

The facts and circumstances forming the basis for these grounds are:

1) CS Energy hold Environmental Authority EPPR00536313 (the EA) which authorises Environmentally Relevant Activities (ERA):
   - 14 – Electricity Generation, 2: Generating electricity by using a fuel, other than gas, at a rating capacity of, (b) more than 150MW electrical.
   - 08 – Chemical Storage, 1: Storing a total of 50t or more of chemicals of dangerous goods class 1 or class 2, division 2.3 under subsection (1)(a).
   - 08 - Chemical Storage, 3: Storing more than 500 cubic metres of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c).
   - 56 – Regulated Waste Storage, Receiving and storing regulated waste.

Queensland Government

- 60 - Waste disposal, 1: Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1) (a), (d) more than 200,000t.
- 63 – Sewage Treatment, 1: Operating sewage treatment works, other than no-release works, with a total daily design capacity of, (b-ii) more than 100 but not more than 1500EP otherwise.

2) Lot 1/RP615528 and Lot 4/SP103557 are listed on the Environmental Management Register.

3) On 13 August 2019 CS Energy engaged an independent suitably qualified person (**SQP**) under the *Environmental Protection Act 1994* (the Act) to commence investigation works into potential impacts and risks associated with the historical use of aqueous film-forming foam (AFFF) at the premises.

4) On 23 July 2020 CS Energy provided the department with a preliminary site investigation (**PSI)** titled *Preliminary PFAS Environmental Investigation – Callide Power Station* which identified potential onsite risks associated with the historical use of AFFF at the premises. The report recommended completion of an onsite sampling program to quantify potential risks identified, including sampling of surface water, groundwater, soils and sediment.

5) On 1 October 2020 CS Energy provided the department with a sampling analysis and quality plan (**SAQP)** titled *Sampling Analysis and Quality Plan (PFAS) – Callide Power Station* detailing proposed investigation of potential AFFF at the premises and potential migration pathways, targeting groundwater, surface water, soil and sediment.

6) On 17 November 2020 CS Energy notified the department of preliminary PFAS sampling results from the Callide Power Station which indicated that onsite groundwater, surface water, soils and sediments contained varying levels of PFAS contamination, including the detection of PFAS in groundwater monitoring wells located along the southern boundary of the premises.

7) On 18 December 2020 CS Energy provided the department with a monitoring plan titled *Addendum Monitoring Plan – Callide Power Station SAQP (PFAS)*. The addendum monitoring plan detailed proposed investigation at offsite groundwater and surface water monitoring locations following detection of PFAS in groundwater monitoring wells located along the southern boundary of the premises.

8) On 29 January 2021 CS Energy provided the department with a report titled *Callide Power Station – Targeted PFAS Environmental Investigation* which states 'Historical information available for the site identifies that potential historical use of AFFF at the Callide B and C Power Station site is likely to be less than 1,000L, including use of up to 300L of AFFF concentrate in training activities, system tests and use/maintenance of extinguishers, and a further approximately 500L of AFFF concentrate used in emergency response associated with coal fires at the Coal Plant.

9) The report also stated that 'the most likely potential onsite pathway comprised the potential migration from primary to secondary source areas to offsite receptors including surface waters (Callide Creek, Dunn Creek and Callide Dam) and fractured rock aquifers located beneath the site (connected to alluvial aquifers and surface water)'.

10) On 4 February 2021 CS Energy notified the department of detection of PFAS exceeding the Australian Drinking Water Guideline (ADWG) for PFOS + PFHxS (0.07 µg/L) in offsite groundwater monitoring wells downstream of the site following implementation of the Addendum Monitoring Plan.

11) On 10 February 2021 CS Energy engaged an approved contaminated land auditor to oversee the implementation of the investigation.

12) On 24 September 2021 CS Energy submitted sampling results to the department which indicated that concentrations of PFOS + PFHxS monitored in 9 onsite groundwater bores were above the ADWG.

13) Sampling results submitted on 24 September 2021 also indicate concentrations of PFOS + PFHxS above the ADWG in private groundwater bores downstream of the site with concentrations up to 0.369ug/L.

14) On 24 September 2021, CS Energy reported that 6 private bores located downstream of the site used for drinking water were being impacted by PFAS contamination above the ADWG levels and that CS Energy was supplying drinking water to 15 households who relied upon these bores for drinking and/or domestic purposes.

15) An environmental value is defined in section 9 of *the Act* as follows:
    a) *A quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or*
    b) *Another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation.*

16) Under the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (Water EPP), all Queensland waters including groundwater and surface waters have prescribed environmental values and water quality objectives. Environmental values and water quality objectives for these waters are listed in schedule 1 of the Water EPP.

17) The groundwater environmental values which apply in the Callide Creek Catchment include drinking water, irrigation, farm water supply, aquatic ecosystem protection, stock water, primary recreation, industrial use and cultural and spiritual values.

18) Groundwater downstream of the site is used by landholders for drinking, domestic, irrigation, farm water supply and stock watering.

19) The groundwater flows through the Callide Creek Aquifer generally in a westerly direction from the premises.

20) Public amenity and safety are environmental values prescribed by the Act, that may be adversely affected by PFAS contamination of groundwater, particularly through contamination of drinking water above the ADWG.

21) Ecological health is an additional environmental value prescribed by the Act that has the potential to be adversely affected by the release of PFAS into the environment, through bioaccumulation in aquatic and terrestrial organisms.

22) PFAS contamination can be environmentally significant due to its persistence, mobility and, for some PFAS, toxicity and potential bioaccumulation in plants and animals (HEPA 2020).

23) Environmental harm is defined in section 14 of *the Act* as follows:

(1) Environmental harm is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.

(2) Environmental harm may be caused by an activity—

(a) whether the harm is a direct or indirect result of the activity; or

(b) whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.

24) PFAS contamination has the potential to negatively impact environmental values by a variety of mechanisms including via concentration and accumulation in food stuff, drinking water, contact, ingestion and product usage.

25) Perfluorooctane sulfonate (PFOS) is a compound that is also PFAS.

26) PFAS compounds, including PFOS, are prescribed water contaminants under Schedule 10 of the Environmental Protection Regulation 2019.

27) Based on the facts and circumstances above, the department is satisfied that the contamination of the land and groundwater by PFAS compounds has the potential to cause environmental harm through migration offsite where it is contributing to contamination of groundwater used for drinking water. The environmental value that is primarily adversely impacted is public safety as the contamination of groundwater is above the Australian Drinking Water Guideline.

B. Requirements

The report on the environmental investigation must address the following relevant matters:

Where existing investigations have been completed, and are relevant to addressing the requirements of this notice, you may use these investigations to address relevant parts of this notice, pending agreement by the SQP and the auditor.

1) **By 5:00 pm on 17 December 2021** you must engage an independent **SQP** under the Act to carry out the requirements of this notice. The SQP must demonstrate skills and experience in technical fields such as soil and groundwater contamination assessment and with particular skills relevant to AFFF firefighting foams containing PFAS.

~~**2)**~~ **By 5:00 pm on 17 December 2021** you must engage an approved contaminated land auditor to undertake an auditor's function as outlined in Section 568(b) of the Act, to oversee the SQP carrying out the requirements of this notice.

3) **By 5:00 pm on 28 February 2022** you must develop and submit a sampling, analysis and quality plan (**SAQP**) to the department to characterise the potential source and extent of PFAS contamination likely to be caused from the release of AFFF at the premises for the purpose of preparing a site investigation report as defined in section 387 of the Act. This plan must be prepared by a SQP and consented to by a contaminated land auditor.

   This investigation detailed in the SAQP must, as a minimum:
   a) evaluate the nature and extent of PFAS contamination likely to have been caused by any direct or indirect release of AFFF from the premises to soil, water, groundwater, sediments and, include biota sampling in Callide Creek adjoining the premises as part of the investigation; and
   b) assess likely pathways of PFAS contamination from the release of AFFF from the premises including, but not limited to, the premises, surface waters, drainage lines, stormwater infrastructure and groundwater in the vicinity of the premises; and
   c) assess the nature of the connectivity/completeness of those likely pathways by, assessing (where applicable) groundwater levels versus surface water levels and connectivity, hydraulic conductivity and groundwater velocity, and evaluate the potential for surface water releases from Callide dam to enhance migration of PFAS contaminants from the site.
   d) the sampling analysis must be generally in accordance with all requirements stated in **Requirement 7**.

4) **By 5:00 pm on 7 March 2022** you must commence sampling and analysis in accordance with the SAQP required by Requirement 3.

5) **By 5:00 pm on 7 September 2022** you must submit a contaminated land investigation document (**CLID**) in accordance with the content requirements of section 389 of the Act, that is a site investigation report detailing the findings of the sampling, analysis and quality plan to determine the nature and extent of impact arising from any direct or indirect release of any hazardous PFAS contaminants from the release of AFFF.

   The CLID must also include, but is not limited to the following:
   a) Evaluate known historical activities undertaken at the premises which has involved the use, storage (including volume), handling, foam types and potential release of AFFF PFAS containing material;
   b) Provide analytical data that characterises the nature of the PFAS at the premises and that which has been released or potentially released to assist in determining the nature and extent of PFAS contamination in the receiving environment;
   c) Provide analysis of potentially affected media including soil, sediment, surface water, groundwater and biota and identify potential pathways for impacts to human and biota receptors;
   d) Provide all monitoring results and an analysis of the extent of PFAS contamination in soils, sediment, surface water, groundwater and biota;
   e) Assess the potential for environmental harm (actual or potential) and provide recommendations for the implementation of reasonable and practicable options to prevent or minimise any further releases of PFAS from identified sources and manage and monitor environmental and human health risks; and
   f) Provide remediation options to remove the contamination and treat the contamination taking into account the extent of any residual contamination in soils, sediment, groundwater and surface waters that affect the premises or other receptors.

6) The investigations required by this notice must meet the requirements for a CLID for the land in accordance with section 389 and 390 of the Act. A CLID must be prepared by a SQP as required by and in accordance with Chapter 12, Part 3 of the Act and be accompanied by an auditor certification that the CLID complies with section 389(1) and (2) of the Act.

7) You must ensure that the following requirements, to the extent that they are applicable and specified requirements are not otherwise referred to, are met when conducting the investigation and preparing the report:

a. The investigation is conducted in accordance with the following:
   i. *the Act* – see https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-1994-062;
   ii. The Policy – see https://www.legislation.qld.gov.au/view/pdf/inforce/current/sl-2019-0156;
   iii. Queensland Water Quality Guidelines (2009) – see https://environment.des.qld.gov.au/management/water/quality-guidelines;
   iv. Monitoring and Sampling Manual 2018 Environmental Protection (Water) Policy 2009 Version 2 June 2018 see - https://environment.des.qld.gov.au/__data/assets/pdf_file/0031/89914/monitoring-sampling-manual-2018.pdf;
   v. National Environmental Protection (Assessment of Site Contamination) Measure 1999 – see http://nepc.gov.au/nepms/assessment-site-contamination;
   vi. Queensland Auditor Handbook for Contaminated Land – see https://www.qld.gov.au/environment/pollution/management/contaminated-land/auditors/auditor-handbook;
   vii. Assessment of impact of human health considering the Tolerable Daily Intakes for PFOS, PFOA, and PFHxS recommended by Food Standards Australia New Zealand (FSANZ);
   viii. Where PFAS are encountered in water bodies at the premise which are accessible to fauna such as birds and mammals, qualitative consideration of water to animal bioaccumulation factors reported in research publications concerning those contaminants in evaluating potential environmental harm to such animals; and
   ix. Assessment of contamination considering guidance provided in the PFAS NEMP – see https://www.qld.gov.au/environment/pollution/management/disasters/investigation-pfas/management-plan.

b. An assessment of edible portions (biota) must be used in estimating risks of exceeding the tolerable daily intakes, being consistent with the Queensland Health Guideline for sampling and analysis of seafood suitable for human health risk assessments of PFAS contamination (see https://www.qld.gov.au/__data/assets/pdf_file/0032/68684/pfas-fish-sampling-protocol.pdf) and adopting portion sizes recommended by Food Standards Australia New Zealand (FSANZ) in addition to assessment of whole species (biota) to evaluate bioaccumulation risk; and

c. Wherever practical, all samples must be analysed by a NATA accredited laboratory (it is noted that in biota sampling this may not be applicable); and

d. The analytical data on all media (soil, sediment, water, groundwater and biota) must include results for sampling to determine total organic fluorine, total oxidisable precursor (TOP) assay, and the suite of 20 to 28 standard fluorinated organic compounds by liquid chromatography-mass spectrometry (LC/MS/MS) available from commercial laboratories reported as the

analyses for the resulting perfluorinated carboxylates for C4 to C14 carbon chain length (TOP C4-C14); and

e. Note that as analytical and instrumental improvements are made regarding the analysis for PFAS it is understood that some laboratories are increasing the standard suite which may assist you in distinguishing between the premises sources of PFAS and other potential sources; and
f. Where TOP Assay is performed, quality assurance checks must include that oxidant exhaustion has not occurred (e.g. reanalysis to determine presence of fluorotelomer); and
g. Groundwater bores are constructed in accordance with the Minimum Construction Requirements for Water Bores in Australia (4th edition).

8) **By 5:00 pm on 7 October 2022** you must submit a final environmental report to department that demonstrates that the requirements of this environmental evaluation have been completed.

The environmental investigation must be carried out, and the environmental report prepared by a suitably qualified person. A suitably quality person is defined as a person who has professional qualifications, training, skills or experience relevant to the Environmental Evaluation requirements, and can give authoritative assessment, advice and analysis in relation to the Environmental Evaluation using relative relevant protocols, standards, methods or literature.

As the recipient of this notice, you are also required to provide a statutory declaration in the form attached, to accompany the environmental report submitted to the department.

The suitably qualified person who prepares the environmental report and the contaminated land auditor must also provide a statutory declaration in the form attached to the environmental report submitted to the department.

Copies of the template statutory declarations can also be accessed from the Queensland Government website at www.qld.gov.au, using the publication number as a search term:

1. Statutory declaration environmental evaluation for recipient (ESR/2016/1997)
2. Statutory declaration for suitably qualified person (ESR/2016/2266)
3. Statutory declaration for auditor (ESR/2016/2265)

Take notice:

1. The requirements of the notice to conduct or commission an environmental investigation take effect immediately upon service of this notice;
2. This notice remains in force until further notice from the department; and
3. You are responsible for meeting the costs of conducting or commissioning the environmental evaluation, preparing the environmental report and providing any further information as requested by the department.

C. Reviews and appeals

The provisions regarding reviews of decisions and appeals are found in sections 519 to 539 of the Act.

A person who is dissatisfied with certain decisions of the department, may be able to apply to have the department review that original decision.

Generally, a request to have a decision reviewed must:

- be made within 10 business days of the decision being notified to the person;
- be supported by enough information to enable the department to decide the application for review; and
- be made using the application form, Application for review of original decision (ESR/2015/1573) available on the Queensland Government website at www.qld.gov.au, using the publication number (ESR/2015/1573) as a search term.

Where an application has been made for a decision to be reviewed, the applicant may also apply to the relevant court for a stay of the decision to secure the effectiveness of the review.

Once the original decision has been reviewed, a person who is dissatisfied with the review decision may be able to appeal against that decision to the relevant court within 22 business days after receiving notice of the review decision.

A person whose interests are or would be adversely affected by a decision of the department may also be able to request a statement of reasons for a decision or a statutory order review under the *Judicial Review Act 1991*.

For further information about reviews and appeals see the information sheet, Internal review and appeals (ESR/2015/1742) available on the Queensland Government website at www.qld.gov.au, using the publication number (ESR/2015/1742) as a search term.

The information sheets are available on the Queensland Government website at www.qld.gov.au, using the publication number as a search term.

You may have other legal rights or obligations and should seek your own legal advice.

D. Penalty

Failure to comply with a notice to conduct or commission an environmental evaluation is an offence.

1. The maximum penalty for an individual is 300 penalty units.
2. The maximum penalty for a corporation is 1500 penalty units.

Should you have any queries in relation to this notice, please contact Joshua Radloff, A/Team Leader on (07) 4971 6509 or email cwes_gladstone@des.qld.gov.au.



Signature

15 December 2021

Date

Kate Grayson

Manager (Compliance)

Delegate of the Chief Executive

Department of Environment and Science

Environmental Protection Act 1994

Notice

Environmental Protection Act 1994

Environmental Evaluation

Notice to conduct or commission an environmental evaluation

This notice to conduct or commission an environmental evaluation is issued by the administering authority pursuant to section 326B of the Environmental Protection Act 1994 *on 15 December 2021. This amended version has been made under section 24AA of the* Acts Interpretation Act 1954.

CS Energy Limited
Level 2, HQ (North Tower) 540 Wickham Street
FORTITUDE VALLEY QLD 4006

Your reference: EPPR00536313 | C-CPLRC-100046232 | E-100046349

Tuesday, 4 October 2022

Take notice: that under the *Environmental Protection Act 1994* (the Act) this amended notice to conduct or commission an environmental investigation is issued to CS Energy Limited (you) (CS Energy) by the administering authority. The administering authority is the Chief Executive of the Department of Environment and Science (the department).

This amended notice to conduct or commission an environmental investigation is issued in respect of the activities of CS Energy on land described as Lot 1/RP615528 and Lot 4/SP103557 (the premises).

The notice to conduct or commission an environmental investigation was originally issued on 15 December 2021. New text in the amended notice is shown as underlined.

A. Grounds

The notice to conduct or commission an environmental investigation is issued on the following grounds:

1. Under section 326BA of the Act, the department is satisfied on reasonable grounds that:
   (a) particulars of the land are recorded in the environmental management register or contaminated land register,
   (b) the hazardous contaminant contaminating the land is in a concentration that has the potential to cause serious environmental harm or material environmental harm,
   (c) a person, animal or another part of the environment may be exposed to the hazardous contaminant, whether on the land or not.

The facts and circumstances forming the basis for these grounds are:

1) CS Energy hold Environmental Authority EPPR00536313 (the EA) which authorises Environmentally Relevant Activities (ERA):
   - 14 – Electricity Generation, 2: Generating electricity by using a fuel, other than gas, at a rating capacity of, (b) more than 150MW electrical.

Queensland Government

- 08 – Chemical Storage, 1: Storing a total of 50t or more of chemicals of dangerous goods class 1 or class 2, division 2.3 under subsection (1)(a).
- 08 - Chemical Storage, 3: Storing more than 500 cubic metres of chemicals of class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c).
- 56 – Regulated Waste Storage, Receiving and storing regulated waste.
- 60 - Waste disposal, 1: Operating a facility for disposing of, in a year, the following quantity of waste mentioned in subsection (1) (a), (d) more than 200,000t.
- 63 – Sewage Treatment, 1: Operating sewage treatment works, other than no-release works, with a total daily design capacity of, (b-ii) more than 100 but not more than 1500EP otherwise.

2) Lot 1/RP615528 and Lot 4/SP103557 are listed on the Environmental Management Register.

3) On 13 August 2019 CS Energy engaged an independent suitably qualified person (**SQP**) under the *Environmental Protection Act 1994* (the Act) to commence investigation works into potential impacts and risks associated with the historical use of aqueous film-forming foam (AFFF) at the premises.

4) On 23 July 2020 CS Energy provided the department with a preliminary site investigation (**PSI)** titled *Preliminary PFAS Environmental Investigation – Callide Power Station* which identified potential onsite risks associated with the historical use of AFFF at the premises. The report recommended completion of an onsite sampling program to quantify potential risks identified, including sampling of surface water, groundwater, soils and sediment.

5) On 1 October 2020 CS Energy provided the department with a sampling analysis and quality plan (**SAQP)** titled *Sampling Analysis and Quality Plan (PFAS) – Callide Power Station* detailing proposed investigation of potential AFFF at the premises and potential migration pathways, targeting groundwater, surface water, soil and sediment.

6) On 17 November 2020 CS Energy notified the department of preliminary PFAS sampling results from the Callide Power Station which indicated that onsite groundwater, surface water, soils and sediments contained varying levels of PFAS contamination, including the detection of PFAS in groundwater monitoring wells located along the southern boundary of the premises.

7) On 18 December 2020 CS Energy provided the department with a monitoring plan titled *Addendum Monitoring Plan – Callide Power Station SAQP (PFAS)*. The addendum monitoring plan detailed proposed investigation at offsite groundwater and surface water monitoring locations following detection of PFAS in groundwater monitoring wells located along the southern boundary of the premises.

8) On 29 January 2021 CS Energy provided the department with a report titled *Callide Power Station – Targeted PFAS Environmental Investigation* which states 'Historical information available for the site identifies that potential historical use of AFFF at the Callide B and C Power Station site is likely to be less than 1,000L, including use of up to 300L of AFFF concentrate in training activities, system tests and use/maintenance of extinguishers, and a further approximately 500L of AFFF concentrate used in emergency response associated with coal fires at the Coal Plant.

9) The report also stated that 'the most likely potential onsite pathway comprised the potential migration from primary to secondary source areas to offsite receptors including surface waters (Callide Creek,

Dunn Creek and Callide Dam) and fractured rock aquifers located beneath the site (connected to alluvial aquifers and surface water)'.

10) On 4 February 2021 CS Energy notified the department of detection of PFAS exceeding the Australian Drinking Water Guideline (ADWG) for PFOS + PFHxS (0.07 µg/L) in offsite groundwater monitoring wells downstream of the site following implementation of the Addendum Monitoring Plan.

11) On 10 February 2021 CS Energy engaged an approved contaminated land auditor to oversee the implementation of the investigation.

12) On 24 September 2021 CS Energy submitted sampling results to the department which indicated that concentrations of PFOS + PFHxS monitored in 9 onsite groundwater bores were above the ADWG.

13) Sampling results submitted on 24 September 2021 also indicate concentrations of PFOS + PFHxS above the ADWG in private groundwater bores downstream of the site with concentrations up to 0.369ug/L.

14) On 24 September 2021, CS Energy reported that 6 private bores located downstream of the site used for drinking water were being impacted by PFAS contamination above the ADWG levels and that CS Energy was supplying drinking water to 15 households who relied upon these bores for drinking and/or domestic purposes.

15) An environmental value is defined in section 9 of *the Act* as follows:
    a) *A quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or*
    b) *Another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation.*

16) Under the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (Water EPP), all Queensland waters including groundwater and surface waters have prescribed environmental values and water quality objectives. Environmental values and water quality objectives for these waters are listed in schedule 1 of the Water EPP.

17) The groundwater environmental values which apply in the Callide Creek Catchment include drinking water, irrigation, farm water supply, aquatic ecosystem protection, stock water, primary recreation, industrial use and cultural and spiritual values.

18) Groundwater downstream of the site is used by landholders for drinking, domestic, irrigation, farm water supply and stock watering.

19) The groundwater flows through the Callide Creek Aquifer generally in a westerly direction from the premises.

20) Public amenity and safety are environmental values prescribed by the Act, that may be adversely affected by PFAS contamination of groundwater, particularly through contamination of drinking water above the ADWG.

21) Ecological health is an additional environmental value prescribed by the Act that has the potential to be adversely affected by the release of PFAS into the environment, through bioaccumulation in aquatic and terrestrial organisms.

22) PFAS contamination can be environmentally significant due to its persistence, mobility and, for some PFAS, toxicity and potential bioaccumulation in plants and animals (HEPA 2020).

23) Environmental harm is defined in section 14 of *the Act* as follows:

(1) Environmental harm is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.

(2) Environmental harm may be caused by an activity—

(a) whether the harm is a direct or indirect result of the activity; or

(b) whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.

24) PFAS contamination has the potential to negatively impact environmental values by a variety of mechanisms including via concentration and accumulation in food stuff, drinking water, contact, ingestion and product usage.

25) Perfluorooctane sulfonate (PFOS) is a compound that is also PFAS.

26) PFAS compounds, including PFOS, are prescribed water contaminants under Schedule 10 of the Environmental Protection Regulation 2019.

27) Based on the facts and circumstances above, the department is satisfied that the contamination of the land and groundwater by PFAS compounds has the potential to cause environmental harm through migration offsite where it is contributing to contamination of groundwater used for drinking water. The environmental value that is primarily adversely impacted is public safety as the contamination of groundwater is above the Australian Drinking Water Guideline.

28) On 7 September 2022 CS Energy submitted a Contaminated Land Investigation Document in accordance with Requirement 5 of this environmental investigation.

29) On 28 September 2022, CS Energy met with the department to discuss data gaps identified in the Contaminated Land Investigation Document. As a result of the meeting the department has determined that the timeframe in Requirement 8 will be amended to allow the further investigations to address data gaps and meet the requirements of the environmental investigation.

B. Requirements

The report on the environmental investigation must address the following relevant matters:

Where existing investigations have been completed, and are relevant to addressing the requirements of this notice, you may use these investigations to address relevant parts of this notice, pending agreement by the SQP and the auditor.

1) **By 5:00 pm on 17 December 2021** you must engage an independent **SQP** under the Act to carry out the requirements of this notice. The SQP must demonstrate skills and experience in technical fields such as soil and groundwater contamination assessment and with particular skills relevant to AFFF firefighting foams containing PFAS.

~~2)~~ **By 5:00 pm on 17 December 2021** you must engage an approved contaminated land auditor to undertake an auditor's function as outlined in Section 568(b) of the Act, to oversee the SQP carrying out the requirements of this notice.

3) **By 5:00 pm on 28 February 2022** you must develop and submit a sampling, analysis and quality plan (**SAQP**) to the department to characterise the potential source and extent of PFAS contamination likely to be caused from the release of AFFF at the premises for the purpose of preparing a site investigation report as defined in section 387 of the Act. This plan must be prepared by a SQP and consented to by a contaminated land auditor.

   This investigation detailed in the SAQP must, as a minimum:
   a) evaluate the nature and extent of PFAS contamination likely to have been caused by any direct or indirect release of AFFF from the premises to soil, water, groundwater, sediments and, include biota sampling in Callide Creek adjoining the premises as part of the investigation; and
   b) assess likely pathways of PFAS contamination from the release of AFFF from the premises including, but not limited to, the premises, surface waters, drainage lines, stormwater infrastructure and groundwater in the vicinity of the premises; and
   c) assess the nature of the connectivity/completeness of those likely pathways by, assessing (where applicable) groundwater levels versus surface water levels and connectivity, hydraulic conductivity and groundwater velocity, and evaluate the potential for surface water releases from Callide dam to enhance migration of PFAS contaminants from the site.
   d) the sampling analysis must be generally in accordance with all requirements stated in **Requirement 7**.

4) **By 5:00 pm on 7 March 2022** you must commence sampling and analysis in accordance with the SAQP required by Requirement 3.

5) **By 5:00 pm on 7 September 2022** you must submit a contaminated land investigation document (**CLID**) in accordance with the content requirements of section 389 of the Act, that is a site investigation report detailing the findings of the sampling, analysis and quality plan to determine the nature and extent of impact arising from any direct or indirect release of any hazardous PFAS contaminants from the release of AFFF.

   The CLID must also include, but is not limited to the following:
   a) Evaluate known historical activities undertaken at the premises which has involved the use, storage (including volume), handling, foam types and potential release of AFFF PFAS containing material;
   b) Provide analytical data that characterises the nature of the PFAS at the premises and that which has been released or potentially released to assist in determining the nature and extent of PFAS contamination in the receiving environment;
   c) Provide analysis of potentially affected media including soil, sediment, surface water, groundwater and biota and identify potential pathways for impacts to human and biota receptors;

d) Provide all monitoring results and an analysis of the extent of PFAS contamination in soils, sediment, surface water, groundwater and biota;
e) Assess the potential for environmental harm (actual or potential) and provide recommendations for the implementation of reasonable and practicable options to prevent or minimise any further releases of PFAS from identified sources and manage and monitor environmental and human health risks; and
f) Provide remediation options to remove the contamination and treat the contamination taking into account the extent of any residual contamination in soils, sediment, groundwater and surface waters that affect the premises or other receptors.

6) The investigations required by this notice must meet the requirements for a CLID for the land in accordance with section 389 and 390 of the Act. A CLID must be prepared by a SQP as required by and in accordance with Chapter 12, Part 3 of the Act and be accompanied by an auditor certification that the CLID complies with section 389(1) and (2) of the Act.

7) You must ensure that the following requirements, to the extent that they are applicable and specified requirements are not otherwise referred to, are met when conducting the investigation and preparing the report:

a. The investigation is conducted in accordance with the following:
   i. *the Act* – see https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-1994-062;
   ii. The Policy – see https://www.legislation.qld.gov.au/view/pdf/inforce/current/sl-2019-0156;
   iii. Queensland Water Quality Guidelines (2009) – see https://environment.des.qld.gov.au/management/water/quality-guidelines;
   iv. Monitoring and Sampling Manual 2018 Environmental Protection (Water) Policy 2009 Version 2 June 2018 see - https://environment.des.qld.gov.au/__data/assets/pdf_file/0031/89914/monitoring-sampling-manual-2018.pdf;
   v. National Environmental Protection (Assessment of Site Contamination) Measure 1999 – see http://nepc.gov.au/nepms/assessment-site-contamination;
   vi. Queensland Auditor Handbook for Contaminated Land – see https://www.qld.gov.au/environment/pollution/management/contaminated-land/auditors/auditor-handbook;
   vii. Assessment of impact of human health considering the Tolerable Daily Intakes for PFOS, PFOA, and PFHxS recommended by Food Standards Australia New Zealand (FSANZ);
   viii. Where PFAS are encountered in water bodies at the premise which are accessible to fauna such as birds and mammals, qualitative consideration of water to animal bioaccumulation factors reported in research publications concerning those contaminants in evaluating potential environmental harm to such animals; and
   ix. Assessment of contamination considering guidance provided in the PFAS NEMP – see https://www.qld.gov.au/environment/pollution/management/disasters/investigation-pfas/management-plan.
b. An assessment of edible portions (biota) must be used in estimating risks of exceeding the tolerable daily intakes, being consistent with the Queensland Health Guideline for sampling and analysis of seafood suitable for human health risk assessments of PFAS contamination (see

https://www.qld.gov.au/__data/assets/pdf_file/0032/68684/pfas-fish-sampling-protocol.pdf) and adopting portion sizes recommended by Food Standards Australia New Zealand (FSANZ) in addition to assessment of whole species (biota) to evaluate bioaccumulation risk; and

c. Wherever practical, all samples must be analysed by a NATA accredited laboratory (it is noted that in biota sampling this may not be applicable); and
d. The analytical data on all media (soil, sediment, water, groundwater and biota) must include results for sampling to determine total organic fluorine, total oxidisable precursor (TOP) assay, and the suite of 20 to 28 standard fluorinated organic compounds by liquid chromatography-mass spectrometry (LC/MS/MS) available from commercial laboratories reported as the analyses for the resulting perfluorinated carboxylates for C4 to C14 carbon chain length (TOP C4-C14); and
e. Note that as analytical and instrumental improvements are made regarding the analysis for PFAS it is understood that some laboratories are increasing the standard suite which may assist you in distinguishing between the premises sources of PFAS and other potential sources; and
f. Where TOP Assay is performed, quality assurance checks must include that oxidant exhaustion has not occurred (e.g. reanalysis to determine presence of fluorotelomer); and
g. Groundwater bores are constructed in accordance with the Minimum Construction Requirements for Water Bores in Australia (4th edition).

8) **By 5:00 pm on 13 October 2023** you must submit a final environmental report to department that demonstrates that the requirements of this environmental evaluation have been completed.

The environmental investigation must be carried out, and the environmental report prepared by a suitably qualified person. A suitably quality person is defined as a person who has professional qualifications, training, skills or experience relevant to the Environmental Evaluation requirements, and can give authoritative assessment, advice and analysis in relation to the Environmental Evaluation using relative relevant protocols, standards, methods or literature.

As the recipient of this notice, you are also required to provide a statutory declaration in the form attached, to accompany the environmental report submitted to the department.

The suitably qualified person who prepares the environmental report and the contaminated land auditor must also provide a statutory declaration in the form attached to the environmental report submitted to the department.

Copies of the template statutory declarations can also be accessed from the Queensland Government website at www.qld.gov.au, using the publication number as a search term:

1. Statutory declaration environmental evaluation for recipient (ESR/2016/1997)
2. Statutory declaration for suitably qualified person (ESR/2016/2266)
3. Statutory declaration for auditor (ESR/2016/2265)

Take notice:

1. The requirements of the notice to conduct or commission an environmental investigation take effect immediately upon service of this notice;
2. This notice remains in force until further notice from the department; and

3. You are responsible for meeting the costs of conducting or commissioning the environmental evaluation, preparing the environmental report and providing any further information as requested by the department.

C. Reviews and appeals

The provisions regarding reviews of decisions and appeals are found in sections 519 to 539 of the Act.

A person who is dissatisfied with certain decisions of the department, may be able to apply to have the department review that original decision.

Generally, a request to have a decision reviewed must:

- be made within 10 business days of the decision being notified to the person;
- be supported by enough information to enable the department to decide the application for review; and
- be made using the application form, Application for review of original decision (ESR/2015/1573) available on the Queensland Government website at www.qld.gov.au, using the publication number (ESR/2015/1573) as a search term.

Where an application has been made for a decision to be reviewed, the applicant may also apply to the relevant court for a stay of the decision to secure the effectiveness of the review.

Once the original decision has been reviewed, a person who is dissatisfied with the review decision may be able to appeal against that decision to the relevant court within 22 business days after receiving notice of the review decision.

A person whose interests are or would be adversely affected by a decision of the department may also be able to request a statement of reasons for a decision or a statutory order review under the *Judicial Review Act 1991*.

For further information about reviews and appeals see the information sheet, Internal review and appeals (ESR/2015/1742) available on the Queensland Government website at www.qld.gov.au, using the publication number (ESR/2015/1742) as a search term.

The information sheets are available on the Queensland Government website at www.qld.gov.au, using the publication number as a search term.

You may have other legal rights or obligations and should seek your own legal advice.

D. Penalty

Failure to comply with a notice to conduct or commission an environmental evaluation is an offence.

1. The maximum penalty for an individual is 300 penalty units.
2. The maximum penalty for a corporation is 1500 penalty units.

Should you have any queries in relation to this notice, please contact Joshua Radloff, A/Team Leader on (07) 4971 6509 or email cwes_gladstone@des.qld.gov.au.



Signature

4 October 2022

Date

Kate Grayson

Manager (Compliance)

Delegate of the Chief Executive

Department of Environment and Science

Environmental Protection Act 1994

Queensland Government

Department of
Environment and Science

Ref 101/0037306|C-CPLRC-100046232|E-100046349

4 October 2022

CS Energy Limited
Level 2, HQ (North Tower) 540 Wickham Street
FORTITUDE VALLEY QLD 4006

cc Sally Bulten
Environment & Stakeholder Business Partner
sbulten@csenergy.com.au

Attn: Mr Brendan Monckton

Dear Mr Monckton

Amended Environmental Evaluation E-1000046349

I refer to the *Notice to conduct of commission an environmental evaluation* (EE) issued by the Department of Environment and Science (the department) under section 326B of the *Environmental Protection Act 1994* (the Act) on 15 December 2021 and the subsequent submissions made by CS Energy Limited (CS Energy).

The submissions included a Contaminated Land Investigation Document (CLID) submitted on 7 September 2022 pursuant to Requirement 5 of the EE. The CLID identified data gaps in section 13.2 which require further investigation to meet the requirements of the EE.

The department acknowledges CS Energy's early engagement and, following a meeting with CS Energy representatives on 28 September 2022, considers it appropriate to amend the EE notice. The amendment will allow CS Energy additional time to complete the investigations required to address the identified data gaps.

To meet Requirement 8 of the EE, CS Energy is required to submit an addendum report which will address the data gaps identified in section 13.2 of the CLID. This addendum report will supplement the previously submitted CLID and both documents will be considered the submission of a 'final environmental report' as required by the EE.

Please find attached your amended notice, which replaces the previous notice issued 15 December 2021. The amended notice provides an extension of time until **5:00pm 13 October 2023** for submission of the 'final environmental report' under Requirement 8.

Level 2 | 20-22 Herbert Street
PO Box 5065 Gladstone
Queensland 4680 Australia
Telephone +61 7 4971 6500
Website www.des.qld.gov.au
ABN 46 640 294 485

Should you have any queries in relation to this letter, please contact Joshua Radloff, Senior Environmental Officer on 07 4971 6509 or email cwes_gladstone@des.qld.gov.au.

Yours sincerely

Kate Grayson
Manager (Compliance)
Delegate of the Chief Executive
Department of Environment and Science
Environmental Protection Act 1994

Notice

Environmental Protection Act 1994

Environmental Evaluation

Notice to conduct or commission an environmental evaluation

This notice to conduct or commission an environmental evaluation is issued by the administering authority pursuant to section 326B of the Environmental Protection Act 1994 *on 15 December 2021. This amended version has been made under section 24AA of the* Acts Interpretation Act 1954.

CS Energy Limited
Level 2, HQ (North Tower) 540 Wickham Street
FORTITUDE VALLEY QLD 4006

Your reference: EPPR00536313 | C-CPLRC-100046232 | E-100046349

Monday, 21 August 2023

Take notice: that under the *Environmental Protection Act 1994* (the Act) this amended notice to conduct or commission an environmental investigation is issued to CS Energy Limited (you) (CS Energy) by the administering authority. The administering authority is the Chief Executive of the Department of Environment and Science (the department).

This amended notice to conduct or commission an environmental investigation is issued in respect of the activities of CS Energy on land described as Lot 1/RP615528 and Lot 4/SP103557 (the premises).

The notice to conduct or commission an environmental investigation was originally issued on 15 December 2021. New text in the amended notice is shown as underlined.

A. Grounds

The notice to conduct or commission an environmental investigation is issued on the following grounds:

1. Under section 326BA of the Act, the department is satisfied on reasonable grounds that:
   (a) particulars of the land are recorded in the environmental management register or contaminated land register,
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The facts and circumstances forming the basis for these grounds are:

1) CS Energy hold Environmental Authority EPPR00536313 (the EA) which authorises Environmentally Relevant Activities (ERA):
   - 14 – Electricity Generation, 2: Generating electricity by using a fuel, other than gas, at a rating capacity of, (b) more than 150MW electrical.

Queensland Government

- 08 – Chemical Storage, 1: Storing a total of 50t or more of chemicals of dangerous goods class 1 or class 2, division 2.3 under subsection (1)(a).
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- 63 – Sewage Treatment, 1: Operating sewage treatment works, other than no-release works, with a total daily design capacity of, (b-ii) more than 100 but not more than 1500EP otherwise.

2) Lot 1/RP615528 and Lot 4/SP103557 are listed on the Environmental Management Register.

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> *(1) Environmental harm is any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.*
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>
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26) PFAS compounds, including PFOS, are prescribed water contaminants under Schedule 10 of the Environmental Protection Regulation 2019.

27) Based on the facts and circumstances above, the department is satisfied that the contamination of the land and groundwater by PFAS compounds has the potential to cause environmental harm through migration offsite where it is contributing to contamination of groundwater used for drinking water. The environmental value that is primarily adversely impacted is public safety as the contamination of groundwater is above the Australian Drinking Water Guideline.

28) On 28 September 2022, CS Energy representatives attended a meeting with the department to discuss data gaps identified in the Contaminated Land Investigation Document, which was submitted on 7 September 2022. During the meeting timeframes to undertake the additional investigations were discussed. As a result of the meeting the department has determined that the timeframe in Requirement 8 will be amended to allow the further investigations to occur.

29) On 14 August 2023, CS Energy submitted a written request to the department which stated that further works are required to address the data gaps identified in the Land Investigation Document, which was submitted on 7 September 2022. Following a review of the request, the department has amended the timeframe in Requirement 8 to allow the further investigations to occur.

B. Requirements

The report on the environmental investigation must address the following relevant matters:

Where existing investigations have been completed and are relevant to addressing the requirements of this notice, you may use these investigations to address relevant parts of this notice, pending agreement by the SQP and the auditor.

1) **By 5:00 pm on 17 December 2021** you must engage an independent **SQP** under the Act to carry out the requirements of this notice. The SQP must demonstrate skills and experience in technical fields such as soil and groundwater contamination assessment and with particular skills relevant to AFFF firefighting foams containing PFAS.

~~2)~~ **By 5:00 pm on 17 December 2021** you must engage an approved contaminated land auditor to undertake an auditor's function as outlined in Section 568(b) of the Act, to oversee the SQP carrying out the requirements of this notice.

3) **By 5:00 pm on 28 February 2022** you must develop and submit a sampling, analysis and quality plan (**SAQP**) to the department to characterise the potential source and extent of PFAS contamination likely to be caused from the release of AFFF at the premises for the purpose of preparing a site investigation report as defined in section 387 of the Act. This plan must be prepared by a SQP and consented to by a contaminated land auditor.

   This investigation detailed in the SAQP must, as a minimum:
   a) evaluate the nature and extent of PFAS contamination likely to have been caused by any direct or indirect release of AFFF from the premises to soil, water, groundwater, sediments and, include biota sampling in Callide Creek adjoining the premises as part of the investigation; and
   b) assess likely pathways of PFAS contamination from the release of AFFF from the premises including, but not limited to, the premises, surface waters, drainage lines, stormwater infrastructure and groundwater in the vicinity of the premises; and
   c) assess the nature of the connectivity/completeness of those likely pathways by, assessing (where applicable) groundwater levels versus surface water levels and connectivity, hydraulic conductivity and groundwater velocity, and evaluate the potential for surface water releases from Callide dam to enhance migration of PFAS contaminants from the site.
   d) the sampling analysis must be generally in accordance with all requirements stated in **Requirement 7**.

4) **By 5:00 pm on 7 March 2022** you must commence sampling and analysis in accordance with the SAQP required by Requirement 3.

5) **By 5:00 pm on 7 September 2022** you must submit a contaminated land investigation document (**CLID**) in accordance with the content requirements of section 389 of the Act, that is a site investigation report detailing the findings of the sampling, analysis and quality plan to determine the nature and extent of impact arising from any direct or indirect release of any hazardous PFAS contaminants from the release of AFFF.

   The CLID must also include, but is not limited to the following:
   a) Evaluate known historical activities undertaken at the premises which has involved the use, storage (including volume), handling, foam types and potential release of AFFF PFAS containing material;
   b) Provide analytical data that characterises the nature of the PFAS at the premises and that which has been released or potentially released to assist in determining the nature and extent of PFAS contamination in the receiving environment;
   c) Provide analysis of potentially affected media including soil, sediment, surface water, groundwater and biota and identify potential pathways for impacts to human and biota receptors;

d) Provide all monitoring results and an analysis of the extent of PFAS contamination in soils, sediment, surface water, groundwater and biota;
e) Assess the potential for environmental harm (actual or potential) and provide recommendations for the implementation of reasonable and practicable options to prevent or minimise any further releases of PFAS from identified sources and manage and monitor environmental and human health risks; and
f) Provide remediation options to remove the contamination and treat the contamination taking into account the extent of any residual contamination in soils, sediment, groundwater and surface waters that affect the premises or other receptors.

6) The investigations required by this notice must meet the requirements for a CLID for the land in accordance with section 389 and 390 of the Act. A CLID must be prepared by a SQP as required by and in accordance with Chapter 12, Part 3 of the Act and be accompanied by an auditor certification that the CLID complies with section 389(1) and (2) of the Act.

7) You must ensure that the following requirements, to the extent that they are applicable and specified requirements are not otherwise referred to, are met when conducting the investigation and preparing the report:

a. The investigation is conducted in accordance with the following:
   i. *the Act* – see https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-1994-062;
   ii. The Policy – see https://www.legislation.qld.gov.au/view/pdf/inforce/current/sl-2019-0156;
   iii. Queensland Water Quality Guidelines (2009) – see https://environment.des.qld.gov.au/management/water/quality-guidelines;
   iv. Monitoring and Sampling Manual 2018 Environmental Protection (Water) Policy 2009 Version 2 June 2018 see - https://environment.des.qld.gov.au/__data/assets/pdf_file/0031/89914/monitoring-sampling-manual-2018.pdf;
   v. National Environmental Protection (Assessment of Site Contamination) Measure 1999 – see http://nepc.gov.au/nepms/assessment-site-contamination;
   vi. Queensland Auditor Handbook for Contaminated Land – see https://www.qld.gov.au/environment/pollution/management/contaminated-land/auditors/auditor-handbook;
   vii. Assessment of impact of human health considering the Tolerable Daily Intakes for PFOS, PFOA, and PFHxS recommended by Food Standards Australia New Zealand (FSANZ);
   viii. Where PFAS are encountered in water bodies at the premise which are accessible to fauna such as birds and mammals, qualitative consideration of water to animal bioaccumulation factors reported in research publications concerning those contaminants in evaluating potential environmental harm to such animals; and
   ix. Assessment of contamination considering guidance provided in the PFAS NEMP – see https://www.qld.gov.au/environment/pollution/management/disasters/investigation-pfas/management-plan.
b. An assessment of edible portions (biota) must be used in estimating risks of exceeding the tolerable daily intakes, being consistent with the Queensland Health Guideline for sampling and analysis of seafood suitable for human health risk assessments of PFAS contamination (see

https://www.qld.gov.au/__data/assets/pdf_file/0032/68684/pfas-fish-sampling-protocol.pdf) and adopting portion sizes recommended by Food Standards Australia New Zealand (FSANZ) in addition to assessment of whole species (biota) to evaluate bioaccumulation risk; and

c. Wherever practical, all samples must be analysed by a NATA accredited laboratory (it is noted that in biota sampling this may not be applicable); and
d. The analytical data on all media (soil, sediment, water, groundwater and biota) must include results for sampling to determine total organic fluorine, total oxidisable precursor (TOP) assay, and the suite of 20 to 28 standard fluorinated organic compounds by liquid chromatography-mass spectrometry (LC/MS/MS) available from commercial laboratories reported as the analyses for the resulting perfluorinated carboxylates for C4 to C14 carbon chain length (TOP C4-C14); and
e. Note that as analytical and instrumental improvements are made regarding the analysis for PFAS it is understood that some laboratories are increasing the standard suite which may assist you in distinguishing between the premises sources of PFAS and other potential sources; and
f. Where TOP Assay is performed, quality assurance checks must include that oxidant exhaustion has not occurred (e.g. reanalysis to determine presence of fluorotelomer); and
g. Groundwater bores are constructed in accordance with the Minimum Construction Requirements for Water Bores in Australia (4th edition).

8) **By 5:00 pm on 8 March 2024** you must submit a final environmental report to department that demonstrates that the requirements of this environmental evaluation have been completed.

The environmental investigation must be carried out, and the environmental report prepared by a suitably qualified person. A suitably quality person is defined as a person who has professional qualifications, training, skills or experience relevant to the Environmental Evaluation requirements, and can give authoritative assessment, advice and analysis in relation to the Environmental Evaluation using relative relevant protocols, standards, methods or literature.

As the recipient of this notice, you are also required to provide a statutory declaration in the form attached, to accompany the environmental report submitted to the department.

The suitably qualified person who prepares the environmental report and the contaminated land auditor must also provide a statutory declaration in the form attached to the environmental report submitted to the department.

Copies of the template statutory declarations can also be accessed from the Queensland Government website at www.qld.gov.au, using the publication number as a search term:

1. Statutory declaration environmental evaluation for recipient (ESR/2016/1997)
2. Statutory declaration for suitably qualified person (ESR/2016/2266)
3. Statutory declaration for auditor (ESR/2016/2265)

Take notice:

1. The requirements of the notice to conduct or commission an environmental investigation take effect immediately upon service of this notice;
2. This notice remains in force until further notice from the department; and

3. You are responsible for meeting the costs of conducting or commissioning the environmental evaluation, preparing the environmental report and providing any further information as requested by the department.

C. Reviews and appeals

The provisions regarding reviews of decisions and appeals are found in sections 519 to 539 of the Act.

A person who is dissatisfied with certain decisions of the department, may be able to apply to have the department review that original decision.

Generally, a request to have a decision reviewed must:

- be made within 10 business days of the decision being notified to the person;
- be supported by enough information to enable the department to decide the application for review; and
- be made using the application form, Application for review of original decision (ESR/2015/1573) available on the Queensland Government website at www.qld.gov.au, using the publication number (ESR/2015/1573) as a search term.

Where an application has been made for a decision to be reviewed, the applicant may also apply to the relevant court for a stay of the decision to secure the effectiveness of the review.

Once the original decision has been reviewed, a person who is dissatisfied with the review decision may be able to appeal against that decision to the relevant court within 22 business days after receiving notice of the review decision.

A person whose interests are or would be adversely affected by a decision of the department may also be able to request a statement of reasons for a decision or a statutory order review under the *Judicial Review Act 1991*.

For further information about reviews and appeals see the information sheet, Internal review and appeals (ESR/2015/1742) available on the Queensland Government website at www.qld.gov.au, using the publication number (ESR/2015/1742) as a search term.

The information sheets are available on the Queensland Government website at www.qld.gov.au, using the publication number as a search term.

You may have other legal rights or obligations and should seek your own legal advice.

D. Penalty

Failure to comply with a notice to conduct or commission an environmental evaluation is an offence.

1. The maximum penalty for an individual is 300 penalty units.
2. The maximum penalty for a corporation is 1500 penalty units.

Should you have any queries in relation to this notice, please contact Joshua Radloff, Principal Environmental Officer on (07) 4971 6509 or email cwes_gladstone@des.qld.gov.au.



Signature

21 August 2023

Date

Kate Grayson

Manager (Compliance)

Delegate of the Chief Executive

Department of Environment and Science

Environmental Protection Act 1994

APPENDIX C EMR SEARCH RESULTS

Department of Environment and Science (DES)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454 Brisbane QLD 4001 AUSTRALIA
Email: EMR.CLR.Registry@des.qld.gov.au

Queensland Government

20 November 2023

Site ID: 12271
File Number: 101/43767
Enquiries to: emr.clr.registry@des.qld.gov.au

C S ENERGY LIMITED
LEVEL 12, 31 DUNCAN STREET
FORTITUDE VALLEY QLD 4006

NOTICE OF LAND LISTED ON THE ENVIRONMENTAL MANAGEMENT REGISTER

In accordance with section 378 of the *Environmental Protection Act 1994 (EP Act)* notice is given that the parcel of land described below has been listed on the Environmental Management Register (EMR).

Lot: 1 Plan: RP615528
BANANA SHIRE COUNCIL

959 BILOELA CALLIDE ROAD
MOUNT MURCHISON QLD 4715

The parcel of land has been recorded on the EMR as, after careful consideration of any submissions, it is decided that the land has been affected by a hazardous contaminant. Details of the listing are provided below.

HAZARDOUS CONTAMINANT - This site has been subject to a hazardous contaminant. Refer to the summary given below.

- Asbestos materials found:
  Chrysotile Asbestos & Organic Fibres Detected, Amosite Asbestos Detected, Synthetic Mineral Fibres Detected.

The above details have been added to the particulars of the land already recorded in the EMR which are listed below:

CHEMICAL STORAGE - (other than petroleum products or oil under item 29) – storing more than 10t of chemicals (other than compressed or liquefied gases) that are dangerous goods under the dangerous goods code.

COAL FIRED POWER STATION – operating a coal fired power station.

PETROLEUM PRODUCT OR OIL STORAGE - storing petroleum products or oil -
(a) in underground tanks with more than 200L capacity; or
(b) in above ground tanks with -
(i) for petroleum products or oil in class 3 in packaging groups 1 and 2 of the dangerous goods code - more than 2, 500L capacity; or
(ii) for petroleum products or oil in class 3 in packaging groups 3 of the dangerous goods code - more than 5, 000L capacity; or
(iii) for petroleum products that are combustible liquids in class C1 or C2 in Australian Standard AS1940, 'The storage and handling of flammable and combustible liquids' published by Standards Australia - more than 25, 000L capacity.

WASTE STORAGE, TREATMENT OR DISPOSAL - storing, treating, reprocessing or disposing of regulated waste (other than at the place it is generated), including operating a nightsoil disposal site or sewage treatment plant where the site or plant has a design capacity that is more than the equivalent of 50,000 persons having sludge drying beds or on-site disposal facilities.

The owner may apply for a review of the decision to record the land in the EMR within 10 business days after receipt of this notice, in accordance with section 521 of the EP Act.

A landowner dissatisfied with a review decision may appeal against the decision in accordance with section 531 of the *EP Act.*

For further information about contaminated land matters visit www.qld.gov.au, and search for "contaminated land".



Allen Johns
Department of Environment and Science
Delegate of the Administering Authority
Environmental Protection Act 1994

Department of Environment and Science (DES)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454 Brisbane QLD 4001 AUSTRALIA
www.des.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50805449 EMR Site Id: 30829 05 September 2022
This response relates to a search request received for the site:
Lot: 4 Plan: SP103557

EMR RESULT

The above site IS included on the Environmental Management Register.
Lot: 4 Plan: SP103557
Address: COAL ROAD
BILOELA QLD 4715

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.
ASBESTOS MANUFACTURE OR DISPOSAL -
(a) manufacturing asbestos products; or
(b) disposing of unbonded asbestos; or
(c) disposing of more than 5t of bonded asbestos.
CHEMICAL STORAGE - (other than petroleum products or oil under item 29) - storing more than 10 t of chemicals (other than compressed or liquefied gases) that are dangerous goods under the dangerous goods code.
COAL FIRED POWER STATION - operating a coal fired power station.
PETROLEUM PRODUCT OR OIL STORAGE - storing petroleum products or oil -
(a) in underground tanks with more than 200L capacity; or
(b) in above ground tanks with -
(i) for petroleum products or oil in class 3 in packaging groups 1 and 2 of the dangerous goods code - more than 2, 500L capacity; or
(ii) for petroleum products or oil in class 3 in packaging groups 3 of the dangerous goods code - more than 5, 000L capacity; or
(iii) for petroleum products that are combustible liquids in class C1 or C2 in Australian Standard AS1940, 'The storage and handling of flammable and combustible liquids' published by Standards Australia - more than 25, 000L capacity.
WASTE STORAGE, TREATMENT OR DISPOSAL - storing, treating, reprocessing or disposing of regulated waste (other than at the place it is generated), including operating a nightsoil disposal site or sewage treatment plant where the site or plant has a design capacity that is more than the equivalent of 50, 000 persons having sludge drying beds or on-site disposal facilities.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please email emr.clr.registry@des.qld.gov.au

Administering Authority

Department of Environment and Science (DES)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454 Brisbane QLD 4001 AUSTRALIA
www.des.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50805448 EMR Site Id: 12271 05 September 2022
This response relates to a search request received for the site:
Lot: 1 Plan: RP615528

EMR RESULT

The above site IS included on the Environmental Management Register.
Lot: 1 Plan: RP615528
Address: COAL ROAD
MOUNT MURCHISON QLD 4715

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.
PETROLEUM PRODUCT OR OIL STORAGE - storing petroleum products or oil -
(a) in underground tanks with more than 200L capacity; or
(b) in above ground tanks with -
(i) for petroleum products or oil in class 3 in packaging groups 1 and 2 of the dangerous goods code - more than 2, 500L capacity; or
(ii) for petroleum products or oil in class 3 in packaging groups 3 of the dangerous goods code - more than 5, 000L capacity; or
(iii) for petroleum products that are combustible liquids in class C1 or C2 in Australian Standard AS1940, 'The storage and handling of flammable and combustible liquids' published by Standards Australia - more than 25, 000L capacity.
CHEMICAL STORAGE - (other than petroleum products or oil under item 29) - storing more than 10 t of chemicals (other than compressed or liquefied gases) that are dangerous goods under the dangerous goods code.
COAL FIRED POWER STATION - operating a coal fired power station.
WASTE STORAGE, TREATMENT OR DISPOSAL - storing, treating, reprocessing or disposing of regulated waste (other than at the place it is generated), including operating a nightsoil disposal site or sewage treatment plant where the site or plant has a design capacity that is more than the equivalent of 50, 000 persons having sludge drying beds or on-site disposal facilities.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-
1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

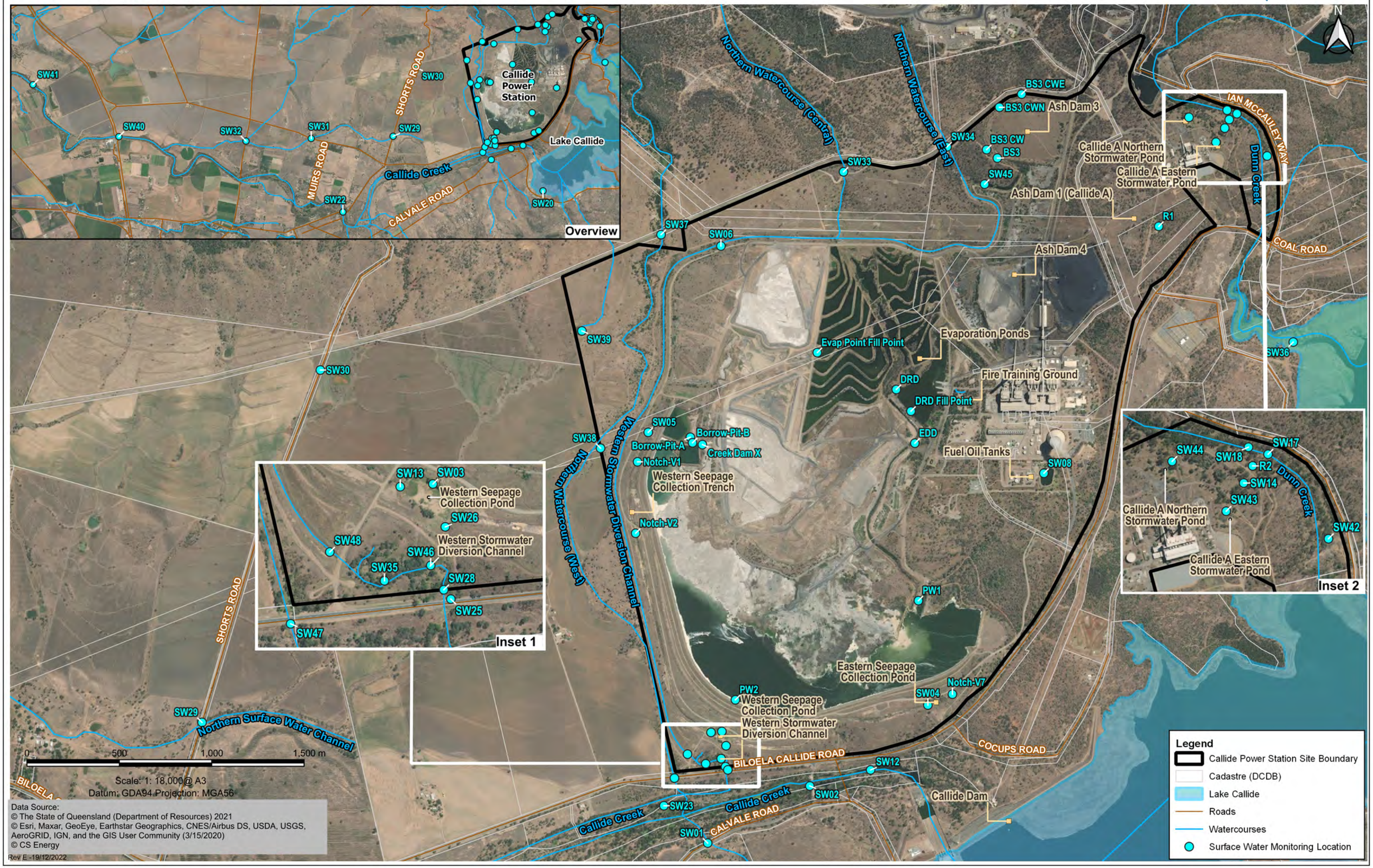
If you have any queries in relation to this search please email emr.clr.registry@des.qld.gov.au

Administering Authority

APPENDIX D CS ENERGY MONITORING LOCATIONS

CS Energy
PFAS investigation (Callide Power Station)

Figure F1
Surface Water Monitoring Locations

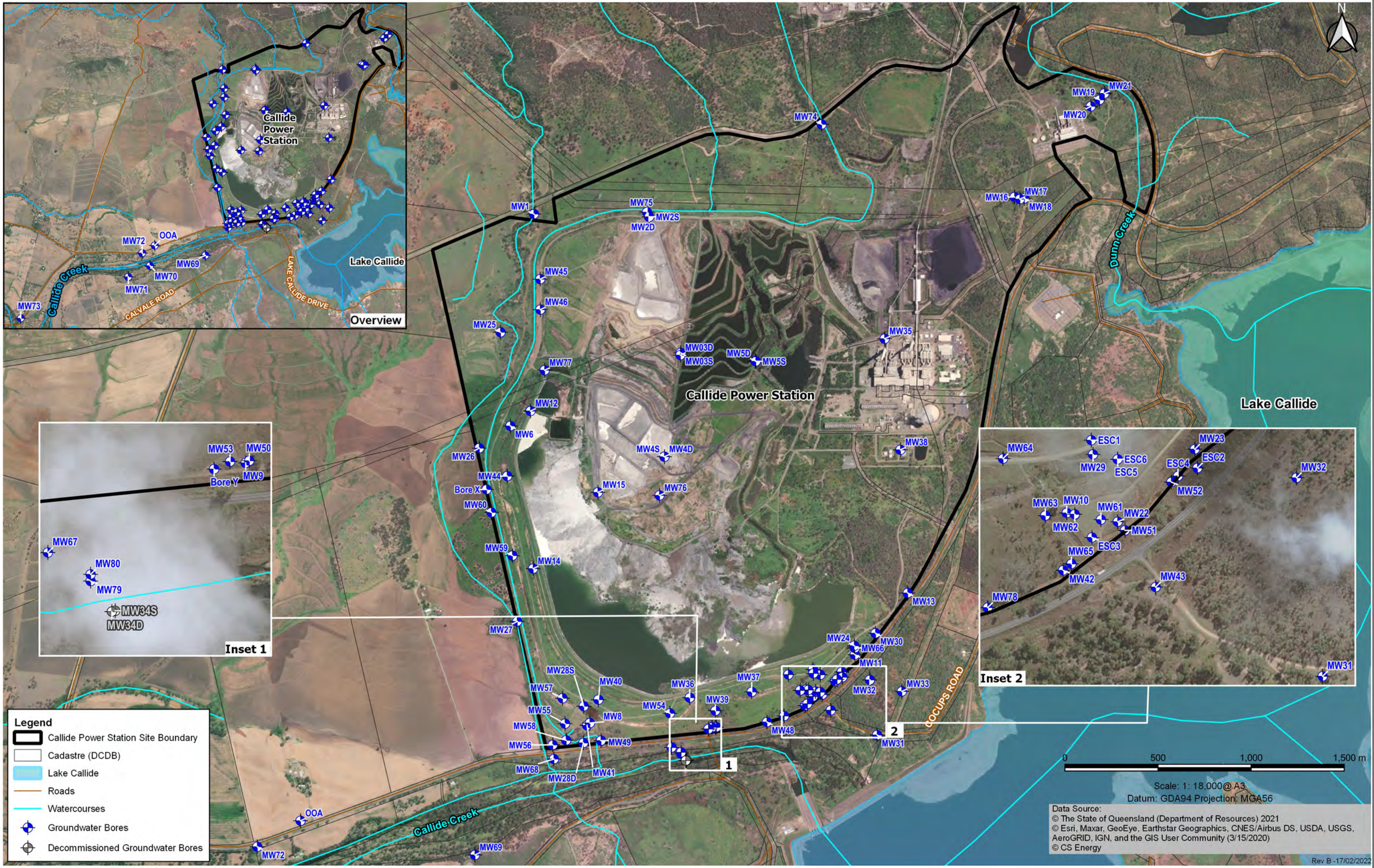


Data Source:
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Rev E -19/12/2022

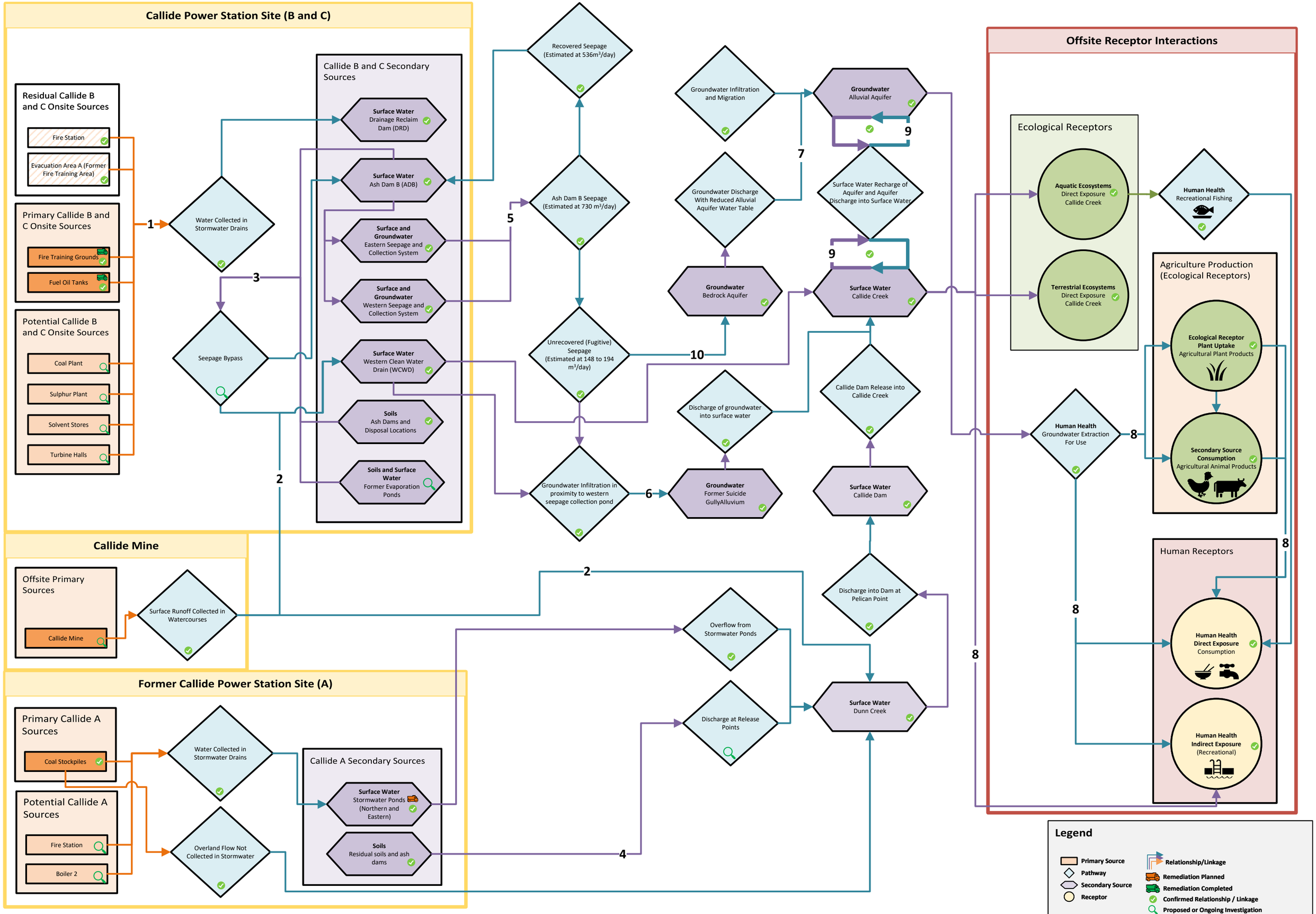
CS Energy
PFAS investigation (Callide Power Station)

Figure F2
Groundwater Monitoring Locations



APPENDIX E CONCEPTUAL SITE MODEL

Figure F1: Conceptual Site Model



	Sources	Secondary Sources	Pathway	Receptors
Dunn Creek and Callide Dam	Callide Power Station A Callide Mine		Surface Water Flow	Human Health (Recreational)
Callide Creek	Callide Power Station B and C	Seepage Recovery and Seepage Bypass	Surface Water Flow Groundwater Flow	Ecosystems Direct Exposure Callide Creek Human Health (Recreational) Human Health Direct Exposure Consumption

Legend

- Primary Source
- Pathway
- Secondary Source
- Receptor
- Relationship/Linkage
- Remediation Planned
- Remediation Completed
- Confirmed Relationship / Linkage
- Proposed or Ongoing Investigation

Sources

Secondary Sources

Pathway

Receptors

Callide Power Station B and C
- Areas of AFFF Usage

Callide Mine
-Areas of AFFF Usage

Seepage Recovery and Seepage Bypass

Waste Containment Facility
-Ash Dams
-Water Storage
-Evaporation Ponds
-Impacted Soils

Releases from Callide Dam
(See Dunn Creek CSM)

Recovered Seepage
Approximately 70 to 80%

Fugitive Seepage
Approximately 20 to 30%

Groundwater Flow/ Groundwater Usage

Surface Water Flow/Use

Downstream Receptors

Human Health
(Recreational)

Includes:
-Swimming (Callide Creek)
-Swimming Pools (Supplied by Groundwater)

Human Health
(Consumption)

Includes:
-Consumption of Catches
-Groundwater Supplied Vegetables/Stock/Drinking Supply

Ecosystems

Legend

- Primary Source
- Pathway
- Secondary Source
- Receptor
- Relationship/Linkage
- Remediation Planned
- Remediation Completed
- Confirmed Relationship / Linkage
- Proposed or Ongoing Investigation

Callide Creek

Dunn Creek and Callide Dam

Sources	Secondary Sources	Pathway	Receptors

Callide Power Station A
- Areas of AFFF Usage

Callide Mine
-Areas of AFFF Usage

Impacted Soils
-Ash Dams
-Residual Soils

Licenced Releases

Surface Water Flow
(Dunn Creek)

Dam Release
(See Callide Creek)

Callide Dam

Human Health
(Recreational)

Includes:
-Primary (Swimming) and Secondary (Boating) Recreation

Human Health
(Consumption)

Includes:
-Consumption of Catches
-Biloela Town Water Supply

Ecosystems

Legend

- Primary Source
- Pathway
- Secondary Source
- Receptor
- Relationship/Linkage
- Remediation Planned
- Remediation Completed
- Confirmed Relationship / Linkage
- Proposed or Ongoing Investigation

Callide Creek

Secondary Sources

Pathway

Receptors

PFAS Impacted Groundwater

PFAS Impacted Surface Water in Callide Creek

Groundwater Abstraction

Secondary Source Consumption

Secondary Source Plant Uptake Irrigated Feed

Secondary Source Plant Uptake Irrigation

Local Human Receptor

Human Health Indirect Exposure (Recreational/ Domestic)

Human Health Direct Drinking Water Consumption

Human Health Meat / Home Produce Consumption

Market

Legend

- Relationship/Linkage
- Primary Source
- Pathway
- Secondary Source
- Agricultural Receptor
- Human Receptor

Callide Valley Alluvial Aquifer
Callide Creek
Seepage Recovery Area
Ash Dam B
Drains Reclaim Dam
Truck Water Fill Point
Fire Training Areas
Blowdown Water Treatment Plant
Callide B/C Station
Evaporation Ponds
Truck Water Fill Point
Dense Phase Ash Pile
Western Stormwater Diversion Channel
Callide A Station
Dunn Creek
Callide Mine Workshops and Maintenance Area

320
300
280
260
240
220
200
180
RL (mAHD)

Western Seepage Collection Trench

Alluvium
Seepage Recovery Bore
Groundwater Wells (Irrigation/Drinking)
Crops

Tertiary sediments present on western side of Ash Dam B. Kroombit Creek Beds elsewhere

Kroombit Creek Beds

Rainbow Creek Beds

Callide Coal Measures

Distance (km)
0
1
2
3
4
5

Legend

- Kroombit Creek Beds
- Tertiary Sediments
- Water Body
- Rainbow Creek Beds
- Ash-dense Phase
- Potential PFAS Migration Pathway Surface Water
- Ash-lean Phase
- Potential PFAS Migration Pathway Groundwater
- Quaternary Alluvium
- Groundwater Level

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File Path: G:\GIS\Epic Environmental\Projects\BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.02\Callide Power Station Environmental Evaluation\Figure F8 Generalised Conceptual Site Model.qgz

epic ENVIRONMENTAL

Not to Scale

CS Energy
PFAS investigation (Callide Power Station)
Callide Power Station Environmental Evaluation

Figure F8
Generalised Conceptual Site Model

PFAS migration from onsite source areas via surface water.

- Historical mass of PFAS in AFFF released to ground estimated to be 16.2kg
- Residual mass of PFAS in soils (areas of AFF use estimated to be 3-4kg
- Approximately 1.3kg PFAS chemically stabilised at fire training ground and fuel oil tanks (reduction in leachability >99.7%)

Onsite movement of surface water within Waste Containment Facility

- Residual PFAS mass in onsite surface water estimated to be 0.1—0.6 kg

Surface water from mine area

- Diverted around Waste Containment Facility
- Discharges to Callide Creek, with some infiltration to Alluvial Aquifer
- PFAS mass unknown

Downstream PFAS migration along Callide Creek (surface water)

- Surface water combines with Kroombit Creek (approximately 28 km downstream of CPS) and discharges to the Don River (approximately 60 km downstream of CPS)
- Mass of PFAS historically released downstream (beyond Jambin Dakenba Rd) via surface water flow unknown

Shallow Seepage (surface water)

- Collected as surface water and returned to Waste Containment Facility (occasional licenced release)

PFAS migration along Callide Creek (surface water)

- When water levels in the aquifer are low (deep) surface water will infiltrate to groundwater.
- When water levels in the aquifer are high (shallow) surface water will continue to downstream catchment.
- Groundwater may discharge to surface water when water table high (aquifer full)

Callide Mine
Dunn Creek
Callide B and C Stations
Waste Containment Facility
Western Seepage Collection Pond
Eastern Seepage Collection Pond
Lake Callide
Callide Creek
BILOELA - CALLIDE ROAD
Grevells Road
Shepherdson Road
Jambin Dakenba Road
Tognolini Baldwin Road
Calvale Road
Burnett Highway

Legend

- Callide power station - site boundary
- Inferred Auqifer Extent (DES Groundwater Dependent Ecosystem - Unconsolidated Sedimentary Aquifer)
- State controlled roads
- Recovered Surface Water
- Surface Water Migration from Offsite Areas
- Surface Water Migration
- Licenced Release

Watercourses

- Major
- Minor

Data Source:
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© State of Queensland (Department of Transport and Main Roads) 2020
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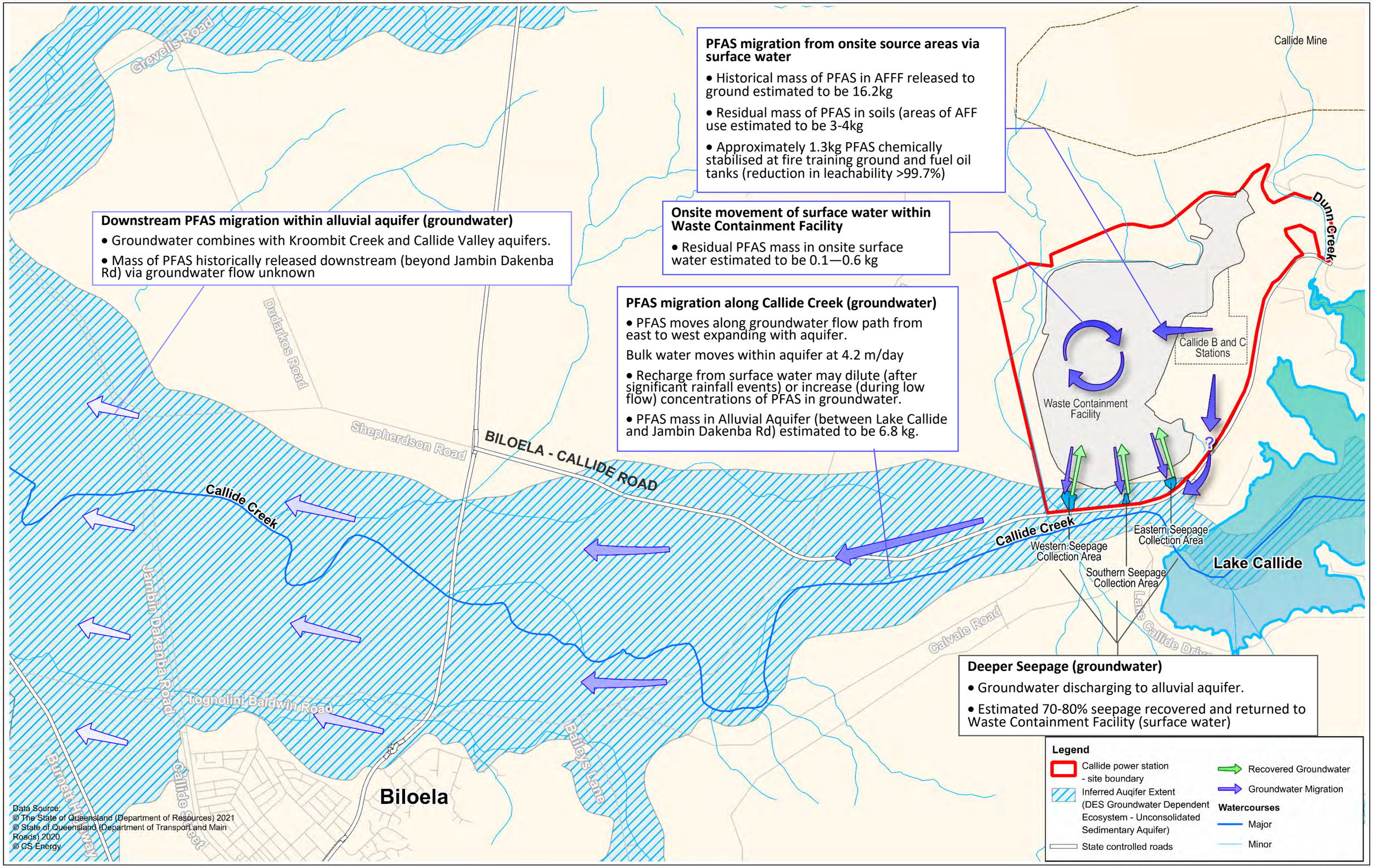
0 500 1,000 1,500 2,000 m

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Datum: GDA94 Projection: MGA zone 56

CS Energy
PFAS investigation (Callide Power Station)
Hydrogeological Summary Report

Figure F7
PFAS Migration in Surface Water



epic ENVIRONMENTAL

0 500 1,000 1,500 2,000 m

Scale: 1: 38,000@ A3

Datum: GDA94 Projection: MGA zone 56

CS Energy
PFAS investigation (Callide Power Station)
Hydrogeological Summary Report

Figure F8
PFAS Migration in Groundwater

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Callide Mine
Northern Watercourse (Central)
Northern Watercourse (East)
MW74
MW19
MW20
MW21
Callide A Power Station
Dunn Creek
MW16
MW18
MW17
MW1
MW75
Western Stormwater Diversion Channel
MW45
MW46
MW25
MW77
MW12
Old borrow areas
MW6
MW26
Bore X
MW44
MW60
Western Seepage Collection Trench
Northern Watercourse (West)
MW59
MW14
MW27
Former/remaining alignment of Suicide Gully
Evaporation Ponds
Fire Training Ground
Fire Station
MW35
MW03S
MW03D
MW5D
MW5S
Callide B
Callide C
Drains Reclaim Dam (DRD)
MW4S
MW4D
MW15
MW76
MW38
Fuel Oil Tanks
Eastern Seepage Collection Pond
MW30
MW13
Western Seepage Collection Pond
MW32
MW33
MW37
MW36
MW54
MW39
MW48
MW31
COOLUPS ROAD
Western Stormwater Diversion Channel
Callide Dam
OOA
MW72
MW69
Callide Creek
MW70
MW71
CALVALE ROAD
LAKE CALLIDE DRIVE

Inset - Western Seepage Collection Pond area
MW57
MW40
MW55
MW8
MW41
MW58
MW56
MW49
MW68

Inset - Eastern Seepage Collection Pond area
MW24
MW66
MW11
ESC1
MW64
ESC5
MW29
ESC6
MW23
ESC2
ESC4
MW52
MW63
MW10
MW61
MW22
MW62
MW51
ESC3
MW65
MW42
MW43
MW78

Inset - Southern Seepage Recovery Area
MW53
MW50
Bore Y
MW9
MW67
MW80
MW79

Legend
- Site Boundary Callide Power Station
- Onsite Investigation Area
- Ash Dam B
- Historical Watercourse
- Roads
- Watercourses
- Groundwater Bores

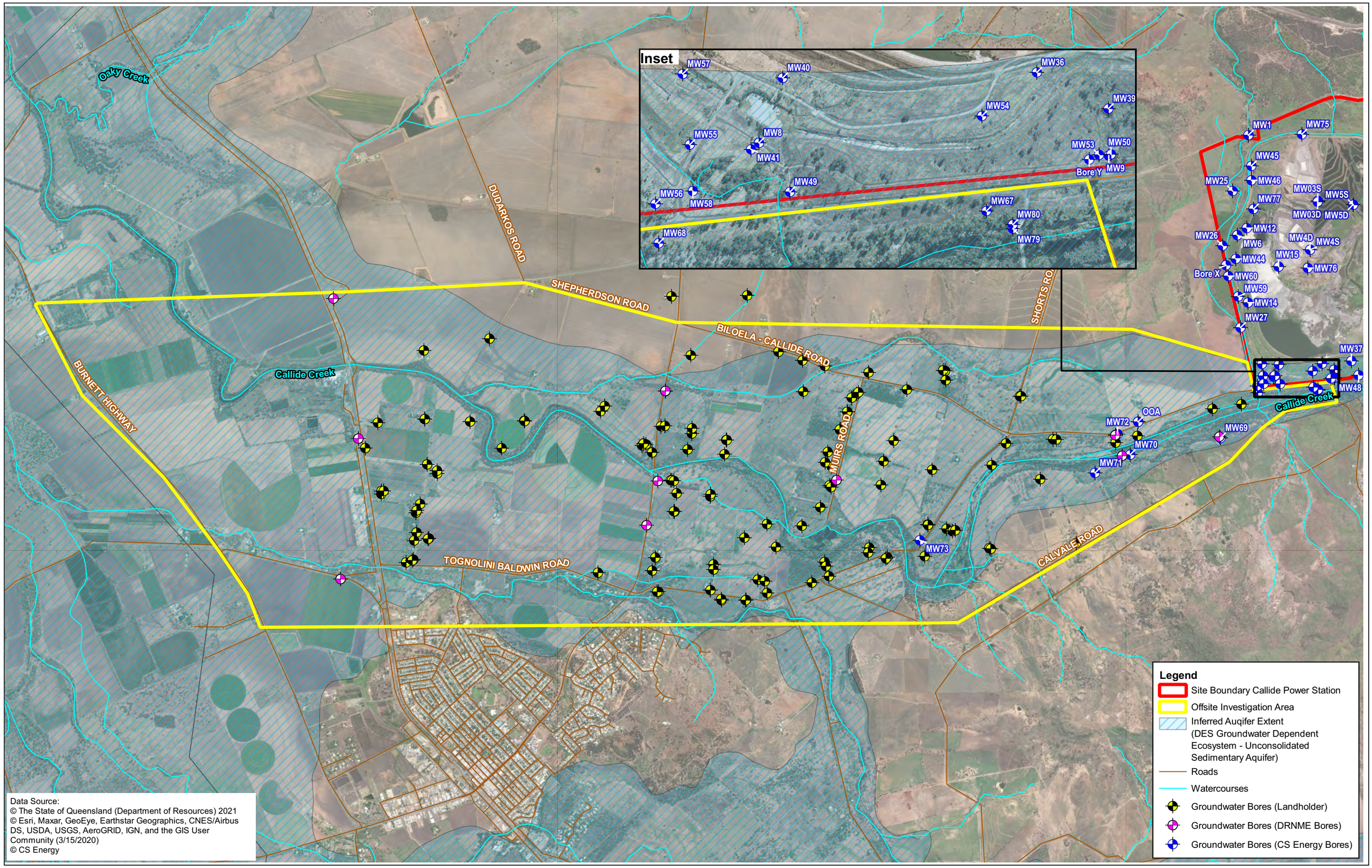
Data Source:
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© CS Energy

0 200 400 600 800 1,000 m

Scale: 1: 22,000@ A3
Datum: GDA94 Projection: MGA zone 56

CS Energy
PFAS investigation (Callide Power Station)
Hydrogeological Summary Report

Figure F1
Onsite Investigation Area



©QGIS 2019 File Path: G:\GIS\Epic Environmental\Projects\BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.04\Hydrogeological Review Summary Report\Figure F2 Offsite Investigation Area.qgz

0 500 1,000 1,500 2,000 m

Scale: 1: 38,000@ A3

Datum: GDA94 Projection: MGA zone 56

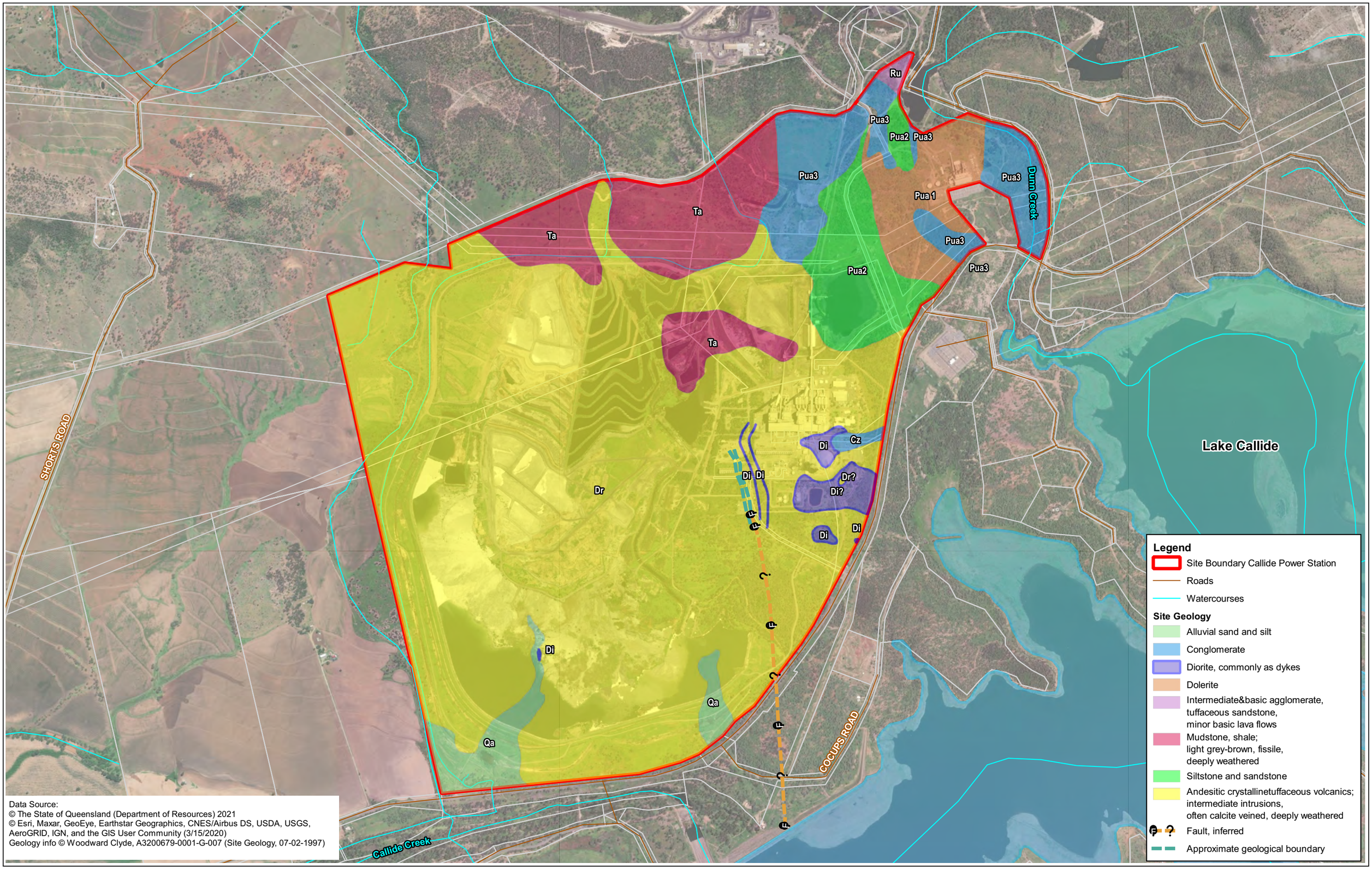
CS Energy

PFAS investigation (Callide Power Station)

Hydrogeological Summary Report

Figure F2

Offsite Investigation Area



Data Source:
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Geology info © Woodward Clyde, A3200679-0001-G-007 (Site Geology, 07-02-1997)

Legend

- Site Boundary Callide Power Station
- Roads
- Watercourses

Site Geology

- Alluvial sand and silt
- Conglomerate
- Diorite, commonly as dykes
- Dolerite
- Intermediate&basic agglomerate, tuffaceous sandstone, minor basic lava flows
- Mudstone, shale; light grey-brown, fissile, deeply weathered
- Siltstone and sandstone
- Andesitic crystallinetuffaceous volcanics; intermediate intrusions, often calcite veined, deeply weathered
- Fault, inferred
- Approximate geological boundary

0 200 400 600 800 1,000 m

Scale: 1: 18,000@ A3
Datum: GDA94 Projection: MGA zone 56

CS Energy
PFAS investigation (Callide Power Station)
Hydrogeological Summary Report

Figure F3
Site Geology Mapping

©QGIS 2019 File Path: G:\GIS\Epic Environmental\Projects\BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.04\Hydrogeological Review Summary Report\Figure F3 Site Geology Mapping.qgz

APPENDIX F DQOS AND QA/QC DISCUSSION

DATA QUALITY OBJECTIVES

Establishing DQOs

The DQO process consists of seven iterative steps, which are designed to clarify the specific project objectives, define the appropriate type of data and inputs required and specify tolerable levels of potential decision errors.

Depending on the intended use of the data, there are two types of DQOs:

- Decision making problems – which are addressed by performing statistical hypothesis tests on the collected data
- Estimation problems – which involve using the collected data to estimate some unknown population parameter together with some reported measure of uncertainty in the estimate

These DQOs are estimation DQOs, and the seven steps and associated planning process output is detailed in **Table I2**. A summary of the DQO planning process is outlined below**:**

- Step 1 of the DQO process aims to define the problem that has initiated the study by stating the problem
- Step 2 of the DQO process aims to define the problem that has initiated the study by identifying the goal of the study. Details associated with Step 2 are presented below.
- Step 3 of the DQO process aims to identify the information that will be required to support the decision and specify which inputs require new environmental measurements.
- Step 4 of the DQO process aims to define the spatial and temporal boundaries that the data must represent to support the decisions. Details associated with Step 4 are presented in the table below.
- Step 5 of the DQO process aims to define the statistical approach by developing a logical "if …, then …, else …" statement that defines the conditions that would cause the decision maker to choose among alternative actions.
- Step 6 of the DQO process aims to specify probability limits for false rejection and false acceptance decision errors.
- Step 7 of the DQO process aims to identify a resource effective sampling and analysis design for generating data that are expected to satisfy the DQOs.

Identification details for the establishment of the DQOs are outlined in **Table I1.**

Table I1. DQO Details

Aspect	Detail
Project:	Callide Power Station - PFAS Environmental Investigation
Field work stage:	PFAS Environmental Investigation (Environmental Evaluation)
Preparation of DQOs	Luke Amies
Review of DQOs	Grace Perkins
DQO Background	A Notice to conduct or commission an EE was issued by DES on 15 December 2021 requiring CS Energy to commission an environmental investigation to determine the nature and extent of impact arising from any direct or indirect release of PFAS from the historical use of AFFF at the site. Following submission of the initial EE environmental investigation report (initial CLID, Epic, 2022c), a meeting was held with DES to discuss the seven remaining data gaps identified and agree on a timeframe to complete additional investigation required to address the data gaps. Correspondence received by DES on 4 October 2022 requested CS Energy complete additional works and provide an addendum report By 5:00 pm on 8 March 2024.
DQOs objective:	The DQO objectives is to answer the principal study questions detailed in Step 2 which aims to assess the nature and extent of potential impacts associated with any direct or indirect release of PFAS contaminant, associated with historical use of AFFF at the site.

Table I2. DQO Planning Process

Aspect	Detail
STEP 1 *Describe the problem, develop a conceptual model of the environmental hazard to be investigated, and identify the general type of data needed.*	• PFAS was detected within groundwater and surface water at the site boundary and in downstream monitoring locations up to approximately 10 km downstream of the site, with some locations reported to exceed the Australian Drinking Water Guideline for PFOS + PFHxS. • DES issued an EE notice requiring CS Energy to commission an environmental investigation to determine the nature and extent of impact arising from any direct or indirect release of PFAS from the historical use of AFFF at the site. • As part of the EE site investigation works completed to date, PFAS has been identified in AD4 and in the Callide A NSP. The source, extent and nature of these detections were not able to be determined, requiring additional data to be collected. • PFAS in groundwater and surface water bodies were identified across the investigation area, requiring additional investigation be completed to facilitate an update to the PFAS flux model across the site.
Establish the planning team and identify the team's decision makers.	• Works are to be undertaken by a Suitably Qualified Person (SQP) in accordance with the requirements of the EE Notice. Details on the project team are outlined in **Section 1.3.**
Develop/refine the conceptual site model (CSM).	• A summary of the site wide CSM is detailed in the initial CLID (Epic, 2022c)
Define the exposure scenarios.	• PFAS is extremely soluble and highly mobile in water, consequently surface water and groundwater flow are important transport mechanisms for PFAS compounds. Potential water flow and contaminant transport from the site to the surrounding environment was likely dominated by surface water and groundwater flows. • The primary exposure pathways associated with human health was ingestion, associated with primary surface water and groundwater pathways (including drinking water) and secondary pathways through the consumption of impacted produce and biota. Ingestion of impacted media, and to a lesser extent dermal contact and inhalation pathways, were considered to be limited.
Discuss alternative approaches to investigation and solving the problem.	• A notice to conduct or commission an environmental investigation was issued in accordance with Section 326B of the Environmental Protection Act 1994. All works detailed in the EE and the subsequent amended notice are required to be completed.
Identify available resources, constraints, and deadlines associated with planning, data collection, and data assessment.	• A CLID (site investigation report) was prepared to address the requirements of the initial EE and delivered to DES on 7 September 2022 • Based upon the identification of data gaps (**Table 3**) an extension was issued by DES with the final EE CLID required for delivery to DES by 1700 on 13 October 2023 • It is noted that multiple investigations have been completed or are currently ongoing to address the full requirements of the EE (detailed in **Table 3**). Further to this, several aspects relevant to the EE are to be completed outside of investigations detailed in the SAQP.

STEP 2
Identify the principal study question(s).
	• The principal study questions for this sampling plan are:
	  • What is the source of PFAS detected in AD4 (Data Gap 1) and at Callide A within the NSP Catchment (Data Gaps 2 and 3)
	  • What is the nature and extent of PFAS contamination at the site, including areas identified to comprise an existing data gap
	  • What are the likely pathways associated with PFAS contamination at the site to other areas of the site, surface waters, drainage lines, stormwater infrastructure and groundwater (Data Gaps 4, 5 and 6)?
	  • For pathways identified, what is the nature of the connectivity/completeness of these pathways and relative contribution to site mass flux of PFAS?
	  • What are the potential risks to human and ecological health including aquatic biota

Define alternative actions that may be taken based upon the range of possible outcomes that result from answering the principal study question.	• Where data gaps are unable to be resolved, further investigation to be completed to inform and close out relevant gaps • Where PFAS contamination has been identified at the site, options for remediation / management can be established. • Where environmental harm is not identified ongoing monitoring of relevant media can continued in accordance with site licencing requirements and included identification and reporting (if required) of any trends or changes in site conditions.
Combine the principal study question and the alternative actions into a decision statement.	• If investigations are unable to close identified data gaps, further investigation will be completed to be completed to inform and close out relevant gaps. • If investigations indicate that direct or indirect releases of AFFF resulted in measurable impact to soil, sediment, surface water, groundwater and/or biota, actions required to prevent or minimise any further releases of contaminants and options for remediation of impacts will be required to be established. • If investigations indicate that direct or indirect releases of AFFF have not resulted in measurable impacts to soil, sediment, surface water, groundwater and/or biota, the previously developed CSM (Epic, 2022c) will be reviewed and updated, with further recommendations made where applicable in the main report.
Organize multiple decisions into an order of sequence or priority.	N/A

STEP 3 *Identify the information that will be required to resolve the decision statement and determine the sources for each item of information identified.*	The following existing information was utilised in resolving the decision statement: • Information on current and historical site activities as detailed in **Section 2** and the completed CLID (Epic, 2022c). • Results from previous PFAS investigations completed at the site summarised in the CLID (Epic, 2022c). • Hydrogeological information available for the site and receiving environments detailed in the CLID (Epic, 2022c). • Groundwater and surface water levels, chemistry, connectivity, hydraulic conductivity and velocity. • Review of the representativeness of monitoring locations to assess potential sources along with potential impacts to identified receptors. • Review of GHD (2022) investigation into the integrity of Ash Dam 2. New/Additional Information: • Identification of all potentially impacted media (including groundwater, surface water, soil) within the nominated study boundary • Update of potential pathways between potentially impacted media and human and ecological receptors • Confirmation of PFAS contamination through sampling and analytical testing by a NATA accredited laboratory (as applicable) to be completed on all media for PFAS (standard suite of 28) to the lowest laboratory limit or reporting • Leachability assessment of soil and sediment samples (as applicable) • Analysis of samples for additional laboratory analytical methods including physicochemical parameters and cations/anions to enable comparison of and between aquifers and surface water bodies • Potential impacts/contributions from adjacent land uses including groundwater and surface water impacts from the Callide Mine and surface water releases from Callide Dam • Sampling and analysis of aquatic biota within Callide Creek and associated waterways

Identify the information needed to establish the action level.	The adopted action levels were detailed in the original SAQP (Epic, 2022b) and was based on environmental guideline values detailed within the following guidelines:
	• PFAS NEMP, including
	  • Table 1. Human health guideline values
	  • Table 2. Human health investigation levels for soil
	  • Table 3. Ecological guideline values for soil
	  • Table 4. Biota guideline values
	  • Table 5. Ecological water quality guideline values (freshwater)
	• NHMRC Guidance on Per and Polyfluoroalkyl substances (PFAS) in Recreational Water (2019)

Confirm that appropriate analytical methods exist to provide the necessary data.	Proposed analytical testing and detection limits will be consistent with the previous sampling events. Laboratory analysis will be completed by Australian Laboratory Services (ALS) (primary laboratory) and Eurofins MGT (Eurofins) (secondary laboratory). Both laboratories are NATA accredited for the analytical testing proposed. All analytical procedures used by the laboratories were in accordance with established internationally recognised procedures such as those published by the United States Environmental Protection Agency (USEPA), American Public Health Association (APHA) and relevant Australian Standards/New Zealand Standards (AS/NZS).

STEP 4 *Specify the characteristics that define the population of interest.*	Onsite investigations will be limited to within Lots 1 RP615528 and 4 SP103557 which form the current Callide Power Station site. Areas of interest for this supplementary investigation includes: • Callide A • AD4 • Seepage recovery areas adjacent to Ash Dam B Offsite investigation areas include areas immediately surrounding the boundaries of the site and included areas within Dunn Creek and Callide Creek. Investigation areas along the alignment of Callide Creek will continue to include public and private lands extending to Jambin Dakenba Road, approximately 10 km west of the site. Aquatic biota sampling will be completed within Callide Creek (including Callide Dam and upstream areas), with reference sampling to be completed within Kroombit Dam (adjacent catchment).

Define the geographic area and media to which the decision statement applies.	• Assessment of groundwater was limited to existing groundwater monitoring and abstraction wells including:
	  • CS Energy groundwater monitoring wells
	  • Department of Regional Development, Manufacturing and Water (DRDMW, formerly DRNME) monitoring wells
	  • Private groundwater abstraction bores
	• Assessment of surface water will be limited to existing onsite surface water bodies along with areas of Callide Creek and Dunn Creek within the investigation area
	• Assessment of soil (including ash) will be limited to Callide A and AD4 within the boundaries of the site
	• Aquatic biota sampling will be completed within Callide Creek (including Callide Dam and upstream areas), with reference sampling to be completed within Kroombit Dam (adjacent catchment)

When appropriate, divide the populations into strata that have relatively homogenous characteristics.	• Assessment of groundwater will target the uppermost aquifer identified beneath the site. • Assessment of surface water will include onsite water bodies and existing environmental monitoring locations within Callide and Dunn Creeks. These will then be divided based upon onsite catchments. • Assessment of soil will target both fill and natural soil profiles. Investigation will not be completed within underlying rock profiles. • Aquatic biota sampling will be completed in accordance with the existing Sampling Plan, targeting species of different trophic levels to inform risks to human and ecological health.
Determine the time frame to which the decision applies.	The findings of the proposed SAQP addendum works will be required to be submitted 13 October 2023 (EE Requirement 8).
Determine when to collect data.	Implementation of this SAQP will be undertaken as a number of separate monitoring/sampling events. It should be noted that some scopes of works had already commenced or are a continuation of the previous SAQP program (prior to issue of the SAQP), including aquatic biota sampling.
Define the scale of the decision making.	The results collected during investigation, in addition to previous information determined to be appropriate, will inform the principal study questions nominated above, and determined whether further works/actions are required to be completed.
Identify any practical constraints on data collection.	Data collection will be limited by a number of factors including: • Site operational considerations which could limit access to monitoring locations, including exclusion zones and existing above and below ground infrastructure. • Access to monitoring locations can be limited due to weather or natural events including rainfall/flooding or storms. • Subsurface conditions could limit the vertical extents of the investigation (refusal on rock). • Potential travel restrictions associated with public health orders.

STEP 5 *Specify the statistical parameter that characterises the population of interest, such as mean, median, maximum or proportion, etc.*	Analytical results will be compared against the adopted assessment criteria to provide an indication of whether potential or actual environmental harm could occur. In addition, analytical results will be utilised to enable comparison of and between soil, sediment, groundwater and surface water (where applicable) to assess representativeness and reliability of monitoring locations along with potential linkages between media. To ensure statistically significant data sets account for seasonal/temporal variations, additional assessment works will be completed from existing established monitoring locations. Data collected from established monitoring locations will result in a more statistically robust data set, with new locations sampled to provide preliminary/indicative information to inform potential sources and/or impacts.
Specify the action level for the decision.	Analytical results will be compared against the adopted assessment criteria. It should be noted that in accordance with the NEMP, a higher level of protection has been adopted (i.e. 99% species protection for slightly-moderately disturbed systems instead of 95% species protection) due to the bioaccumulative nature of PFAS, in the absence of biota sampling (scheduled to be completed early 2023) and completion of a site specific detailed risk assessment. Field QA/QC will be completed in accordance with the proposed QA/QC plan as outlined in **Appendix F**.
Confirm that measurement detection will allow reliable comparisons with the action level.	All analysis will be completed to the lowest practicable limit of reporting (LOR). Analysis of groundwater and surface water will be completed using Super-Ultra Trace methods (0.0002-0.0005 µg/L) to achieve LORs below the 99% Species Protection limits. It is noted that some samples reported elevated LORS due to sample turbidity which is expected to continue through future sampling events.
Combine the outputs from the previous DQO steps and develop a decision rule.	If laboratory results report concentrations above the adopted assessment criteria, then, further assessment will be completed to determine the nature and extent of any impact (where it was not already defined). If field and laboratory QA/QC data report results within acceptable ranges, then, analytical data will be considered suitable for interpretative use.
STEP 6 *Specify the decision rule as a statistical hypothesis test.*	The Null hypothesis (HO) is that that concentrations of PFAS associated with the direct or indirect release of AFFF resulted in concentrations that exceeded the adopted assessment criteria and/or has resulted in environmental harm. The Alternative hypothesis (HA) will be that concentrations of PFAS are below the adopted assessment criteria and/or have not resulted in environmental harm.
Examine consequences of making incorrect decisions from the test.	False rejection or Type I error of determining the site is not causing environmental harm when it is (wrongly rejects a true HO). Consequence will be potential risks and ongoing harm to human health and/or the environment. False acceptance or Type II error of determining the site is causing environmental harm when it is not (wrongly accepts a false HO). Consequence is unnecessary expenditure and implementation of actions to prevent or minimise further harm and/or manage identified risks.

Place acceptable limits on the likelihood of making decision errors.	The acceptable limits on decision errors will be applied for the implementation of these works, and the manner of addressing possible decision errors are to be developed based on the Data Quality Indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness. The potential for significant decision errors will be minimised by: • Assessing whether appropriate sampling and analytical density and representativeness are achieved • Completing a robust QA/QC assessment of the field and laboratory data and application of the probability that 95% of data that satisfied the DQIs, therefore a limit on the decision error will be 5% that a conclusive statement may be incorrect • Ensuring the assessment criteria adopted is appropriate • Sufficient mass/volume of sample media is collected to achieve the lowest possible LORs • Laboratories holding NATA accreditation are used for the analytical methods adopted • The potential for significant decision errors are to be minimised by completing a robust QA/QC program and an environmental assessment that has an appropriate sampling and analytical density for the purposes of the assessment in which representative sampling was undertaken and appropriate sampling methodologies which are to be employed by trained and experienced field personnel
STEP 7 *Document the final sampling and analysis design, along with a discussion of the key assumptions underlying this design.*	Details of the identified data gaps are detailed in **Section 1.2**, with details and justification of proposed sampling detailed in the Addendum SAQP (Epic, 2023a).
Detail how the design should be implemented, together with contingency plans for unexpected events.	Details of the of the proposed sampling and analysis design are detailed in the Addendum SAQP (Epic, 2023a).
Determine the quality assurance and quality control (QA/QC) procedures that would be performed to detect and correct problems to ensure defensible results.	QA/QC procedures which are to be adopted for field and laboratory aspects are outlined in **Appendix F**.
Document the operational details and theoretical assumptions of the selected design in the sampling, analysis and quality plan (SAQP).	Operational details and design elements are detailed in the Addendum SAQP (Epic, 2023a). These are taken from the SAQP prepared for the initial phases of the project (Epic, 2022b)

Field Quality Assurance and Quality Control

The Quality Assurance and Quality Control (QA/QC) protocols to be used during remediation and validation works are shown in (**Table I3**) below.

Table I3: Field QA/QC

Protocol	Description
Sampling Team	Fieldwork was completed by suitably qualified Epic Environmental consultants. Site personnel comprised only professionally qualified environmental scientists and engineers experienced in undertaking soil sampling programs.
QA/QC System	All field actives, sampling and analysis was conducted in accordance with the Epic Environmental Sampling Plan.
Chain of Custody Protocols	All samples were logged and transferred under a completed Chain of Custody Forms.
Preservation	All samples were received at the laboratory in appropriately preserved containers, with preservation including packing samples with ice packs and eskies.
Blind Field Duplicates	Split samples were prepared in accordance with procedures given in Australian Standard AS4482.1-2005 and the NEMP. The frequency of duplicate testing corresponded to at least 10% of samples.

Field Duplicates

The RPD calculations for duplicate samples have been compared against the relevant primary sample. Where either primary or duplicate results have concentrations below laboratory level of reporting, the RPD as not calculated. Field duplicates were collected as part of works detailed in the SAQP (Epic 2023a).

A total of 25 water duplicate pairs (intra-laboratory and inter-laboratory duplicates) were collected for a total of 247 primary groundwater and surface water samples collected during the additional investigations. One soil duplicate pair was collected for a total of 21 primary samples collected from Callide A during the additional investigations, however a total of 5 sets of duplicate pairs have been collected for a total of 45 primary samples collected from Callide A across all investigations. Three duplicate pairs were collected for a total of 26 primary samples collected from Ash Dam 4 during the additional investigations.

Collection and analysis of field duplicates is considered to comply with the DQO of 1 duplicate sample per 10 primary samples, and as such it is considered that investigation and validation results are suitable for interpretive use. It is noted that results from an additional 28 groundwater samples collected by GHD and 36 surface water samples collected by CS Energy (generally comprising opportunistic sampling) have been included for information purposes, with duplicate samples not collected during these sampling events.

A number of RPDs were found to be above the data quality indicators (DQI) for relative percent differences (30%), with exceedances and RPD Calculations presented in the tables included at the end of **Appendix K**. On review, the RPD exceedances for PFAS analytes in water are generally considered to be a result of small differences in concentrations approaching the laboratory's LOR (i.e. within 10 times the LOR), producing high RPDs not reflective of data errors, differences in laboratory methods and heterogeneity of soil/sediment materials observed in soil investigation samples. In general, RPDs for PFAS analytes in water were reported below 100% indicating that variance between samples was not significant.

The primary and duplicate concentrations for all remaining analytes tested were either below the laboratory LOR, or within the acceptable RPD range. On this basis, RPD exceedances are not considered significant in terms of data quality.

Rinsate Blanks

Where reusable sampling equipment was employed, decontamination occurred between sample locations. Rinsate samples were periodically collected (at least once per sampling event) from decontaminated equipment.

A total of 18 rinsate blanks were collected during additional investigation sampling, with rinsate blanks collected from non-disposable/dedicated field equipment including the interface meter. All rinsate blanks reported concentrations below the laboratory's LOR. It is noted that non-dedicated equipment included:

- Groundwater interface meter
- Submersible electric pump
- Surface water sampling pole

On this basis, decontamination procedures utilised are considered to have been adequate.

Field Blanks

A total of 20 field blanks were collected throughout the sampling program. The field blanks were prepared in the field by decanting laboratory prepared rinsate waters into laboratory supplied containers under normal field sampling conditions. Field blanks were collected at least once per sampling event to assess potential cross contamination during sample collection. All field blanks reported concentrations below the laboratory's LOR.

Field QA/QC Review

Review of field QA/QC methods has been undertaken to confirm compliance with the project DQOs, with results summaries in **Table I4**. Items found to be non-compliant are further discussed in the sections below.

Table I4: Validation Data Quality Objectives (DQOs)

DQO	Evaluation Criteria	Review/Comment
Document Completeness	Completion of field calibration records, field notes, chain of custody documentation, laboratory test certificates from NATA- certified laboratories	▪ Chain of custody (COC) and relevant laboratory documentation complete and included in **Appendix K**. ▪ Laboratories NATA approved for requested analysis. ▪ Field calibration records complete with certificates included in **Appendix H**.
Data Completeness	Sampling density is completed in accordance with the approved methodology to address the areas of concern	▪ Sampling completed in accordance with the SAQP.
Data Comparability	Use of appropriate techniques for the sampling, storage and transportation of samples Use of NATA certified laboratory using NEPM 2013 procedures	▪ Sampling completed using approved techniques. Discussion of groundwater sampling methodologies detailed below ▪ Review of groundwater field sheets indicates parameter stabilisation not achieved due to well purging dry in some wells, with sampling completed following recharge. Remaining wells show stabilisation of parameters in accordance with nominated tolerances prior to sampling. ▪ Laboratories NATA approved for requested analysis.

DQO	Evaluation Criteria	Review/Comment
Data Representativeness	Analysis of validation samples in accordance with contaminants of concern as detailed in the SAQP.	▪ All samples analysed for nominated contaminants of concern in accordance with the SAQP
Precision and accuracy for sampling and analysis	Properly trained and qualified field personnel were utilised Blind field duplicates were collected at a minimum rate of 1 in 10 Split field duplicates were analysed at a rate of one per 10 primary samples RPD's (Relative Percent Difference) to be less than 30% Achieve laboratory QC criteria	▪ All works completed by suitably trained and qualified personnel under the supervision of the SQP. ▪ Blind duplicate sampling completed at 1 in 10. Split duplicate sampling completed at rate of 1 in 10 ▪ Review of RPD results indicate results are suitable. ▪ Laboratory QC criteria achieved

Groundwater Sampling Methodology

Groundwater sampling completed as part of the October 2022 to December 2023 monitoring events was completed in accordance with the sampling methods recommended in the groundwater monitoring network review, as detailed in Section 17.1.1 of the initial CLID (Epic, 2022c).

Laboratory Quality and Assurance and Quality Control

ALS Environmental was the nominated primary laboratory to undertake laboratory analysis of validation samples, with Eurofins MGT adopted at the secondary analytical laboratory. Both ALS and Eurofins MGT are NATA accredited laboratories. The following data validation process will be used to determine the accuracy and precision of analytical results and to assess the reliability of the analytical data suite. **Table I5** outlines the analytical data validation criteria, qualifications to the data and the overall QA/QC procedures used for the laboratory testing program.

Table I5: Laboratory QA/QC

Protocol	Description
Holding Times	Holding times are the maximum permissible elapsed time in days from the collection of the sample to its extraction and/or analysis.
Reagent Blanks	The reagent blank sample is a laboratory prepared sample containing the reagents used to prepare the sample for final analysis. The purpose of this procedure is to identify contamination in the reagent materials and assess potential bias in the sample analysis due to contaminated reagents. The QC criteria are no detectable contamination in the reagents. Each analytical procedure will be subject to a reagent blank analysis.
Laboratory Duplicates	Laboratory duplicates are field samples that are split in the laboratory and subsequently analysed a number of times in the same batch. These sub- samples are selected by the laboratory to assess the accuracy and precision of the analytical method. ALS undertakes QA/QC procedures such as calibration standards, laboratory control samples, surrogates, reference materials, sample duplicates and matrix spikes. The adopted laboratory duplicate acceptance criterion is 50% RPD.
Matrix Spikes/ Matrix Spike Duplicates (MS/MSD)	MS/MSDs are field samples to which a predetermined stock solution of known concentrations has been added. The samples are then analysed for recovery of the known addition. Adopted acceptance criteria for MS are 70% - 130%, while laboratory MSD acceptance criterion is 50% RPD.
Blind Field Duplicates	Blind duplicates are split field samples which are both sent to the laboratory for individual analyses. The accepted RPD for non- volatiles is 30% and 50% for volatiles. These samples are analysed to assess the field methods.

The laboratory QA program indicates that the laboratory data was obtained under appropriate sample analysis QA/QC and that the Certificate of Analysis is reliable for the purposes of this assessment.

Completeness

The following information is required to check for completeness of data sets:

- Chain-of-custody forms (signed by the analytical laboratory)
- Sample receipt forms
- All sample results reported
- All blank data reported
- Al lab duplicates reported and relative percent differences (RPDs) calculated
- All surrogate spike data reported
- All matrix spike and matrix spike duplicate (MS/MSD) data reported and RPDs calculated
- NATA stamp on reports

The results of this check indicated that required documentation and data has been reported on NATA approved reports.

Accuracy

Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. The determination of accuracy can be achieved through the analysis of know reference materials or assessed by the analysis of matrix spikes. Spiking of reference materials into an actual sample matrix is the preferred technique because it provides a measure of the matrix effects on the analytical accuracy. Accuracy is measured in terms of percentage recovery. Laboratory personnel calculate percentage recoveries of spiked compounds, which are evaluated against control or acceptance limits taken from the appropriate NATA approved method. If the spike recovery for a sample does not fall within the prescribed control limits, laboratory based corrective action is taken, although the sample is not necessarily re-analysed.

According to Schedule B(3) of NEPM 2013, sample results are qualified when a matrix spike recovery is below or above the QA acceptance criteria. Typically, results are qualified when percentage recovery is below QA acceptance criteria, indicating that sample results may be biased low. However, results are also qualified when percentage recovery is above QA acceptance criteria, indicating that sample results may be biased high.

Matrix spike recoveries were outside the acceptable criteria in the samples outlined below, however acceptable recoveries were generally obtained for laboratory control samples indicating sample matrix interference. On this basis, reported non-compliances are not considered to materially impact on reported laboratory data and results are considered suitable for interpretive use.

The majority of matrix spike non-compliances were reported to be associated with background levels greater than or equal to four times the spike level with the exception of the following samples:

- EB2314305-024 (anonymous) - Recovery of PFOS greater than the upper DQO
- EB2339711-002 (anonymous) - Recovery of PFHpS less than the lower DQOEB233711-002 (anonymous) - Recovery of 10:2 FTS greater than upper DQO

The majority of laboratory control spikes were reported within the acceptable criteria with the exception of the following:

- QC-4922993-002 – Recovery of MeFOSA, EtFOSA, MeFOSE and 4:2 FTS greater than the upper control limit
- QC-5504799-002 – Recovery of MeFOSA and EtFOSA greater than the upper control limit
- QC5513502-002 – Recovery of 4:2 FTS and 8:2 FTS greater than the upper control limit
- QC-5513290-002 – Recovery of MeFOSAA greater than the upper control limit
- QC-5123303-002 – Recovery of MeFOSA greater than the upper control limit
- QC-5123301-002 – Recovery of 10:2 FTS greater than the upper control limit
- QC-5123302-002 – Recovery of 10:2 FTS greater than the upper control limit
- QC-5123304-002 – Recovery of 10:2 FTS greater than the upper control limit
- QC-5104912-002 – Recovery of PFPeS and EtFOSAA greater than the upper control limit

Remaining matrix spike and laboratory control spike samples were reported within prescribed limits.

Precision

Precision is a measure of the ability to reproduce results, and is assessed on the basis of agreement between a set of replicate results obtained from duplicate analyses. The precision of a duplicate determination can be measured as RPD. Laboratory personnel calculate the RPDs of laboratory duplicates and MS/MSDs. Control or acceptance limits are taken from the appropriate method. If the RPD for a sample does not fall within the control limits, laboratory based corrective action is taken, however the sample is not necessarily re-analysed.

The following laboratory duplicate samples reported RPDs outside the acceptable limits:

- EB2306934-022 (MW79) –Sum of PFHxS and PFOS and Sum of PFAS (WA DER List)
- EB2339725-001 (EDC-SED-1) – Sulfate as SO4 2-, calcium and magnesium
- EB2314305-021 (anonymous) – PFHxS, PFOS and PFHxA
- EB2316811-028 (MW97-3.3) – iron

Remaining laboratory duplicates and MS/MSD RPDs were reported within prescribed limits. On this basis, reported non-compliances are not considered to materially impact on reported laboratory data and results are considered suitable for interpretive use.

Sensitivity

Sensitivity criteria are used to monitor achievement or quantification using method detection limits. Method detection limits depends on the method of analysis, the instrument's ability to measure analytes and the sample matrix; in particular, background interferences.

When interferences are present in the sample, a loss of sensitivity can occur resulting in an increase in the method detection limit. In some instances (e.g. where one or more compounds have particularly high concentrations) the sample must be diluted for analysis. This increases the method detection limit by the dilution factor.

Laboratory detection limits for PFAS in groundwater and surface water were raised above the 99% species protection limit in a number of samples collected across all monitoring events. Raised LORs were generally associated with the presence of suspended solids and/or TDS. It is noted that the majority of samples with raised LORs reported detections of PFAS compounds, and as such, results are generally considered suitable for interpretative use.

Laboratory Blanks

Laboratory blanks monitor externally introduced contaminants that potentially derive from glassware, cleaning reagents and digestion reagents during the analysis process. The blank consists of water and digestion reagents prepared in the laboratory. The laboratory blank is treated as a sample in the laboratory, going through the same sample preparation and analysis procedures as corresponding samples.

To meet the QC acceptance criteria the laboratory blanks should have no detectable concentrations of the target compounds. The laboratory blank results are presented in the laboratory analytical reports.

All laboratory blank results were reported within prescribed acceptance criteria.

Holding Times

Holding times from field sampling to laboratory analysis must be minimised to ensure the representativeness of the result obtained. Delays between sampling and analysis can lead to analytes changing due to processes such as volatilisation, mineralisations, and biological modification.

Where standard holding times are exceeded, professional judgement as to the integrity of the data will be required, taking into account such factors as field storage, laboratory storage and even sample bottle characteristics.

Holding times were reported to be exceeded in water for pH, TDS, TSS, alkalinity, cations and anions, nutrients and TOF in a number of work orders, with exceedances generally reported to be within two weeks. Holding

time exceedances in soil were reported for pH, conductivity, sulfur and TOF, with exceedances generally reported to be within 1 week.

All analytical results for the primary contaminant of concern (PFAS) were generally completed within prescribed holding times for the specific test.

Data Quality Objective Completion

The data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical data can generally be relied upon for the purpose of this environmental investigation.

Based on the data collected, and an assessment of the QA/QC process and DQIs, Epic concludes that overall, the quality of the analytical data produced is reliable for the purpose of this investigation; a summary of objective completion can be found in **Table I6** below.

Table I6: Data Quality Indicators and Criteria

DQI	Evaluation Criteria	Status
Document Completeness	Completion of field calibration records, borehole reports, chain of custody documentation, laboratory test certificates from NATA certified laboratories	✓
Data Completeness	Sampling density comparison meets AS4482.1-2005 and NEMP sampling guidelines for potential contaminants of concern at all areas of greatest environmental concern.	✓
Data Comparability	Use of appropriate techniques for the sampling, storage and transportation of samples. Use of NATA certified laboratory using NEPM procedures. Comparison with previous site information.	✓
Data Representativeness	Good sampling coverage of all areas of environmental concern at the site, and selection of representative samples from each sampling location. Targeting area of concern for contaminants of concern.	✓
Precision and Accuracy for Sampling and Analysis	Use properly trained and qualified field personnel. Blind field duplicates to be collected at a minimum rate of 1 in 10 RPDs to be less than 30% for inorganic and 50% for organic analysis. Achieve laboratory QC criteria.	✓

APPENDIX G FIELD SHEETS

DAILY LOG

25/10/22

DATE:	
TIME START:	7:00
TIME END:	17:30

Project No: BC200153.03

Recorded By: DP

Project/Site: CS Energy Callide

Other Field Staff: Mike W

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Collect Surface water samples
- Collect SW samples from Callide A

Equipment in use:

- YSI
- LV
- Sampling pole

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

epic ENVIRONMENTAL

DAILY LOG

25/10/22

DATE:	
TIME START:	7:00
TIME END:	17:30

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Started work at 7:00, contacted Luke
- Collected surface water samples on and off site, dropped hydrasleeves in wells (MW74, MW75, MW76, ~~79, 80~~, MW79, MW80, MW40, MW49, ESC4, RN13030112)
- Collected surface water samples from Callide A
- Finished work at 17:30, contacted Luke

Daniel Popnak

DAILY LOG

DATE:	26/10/22
TIME START:	7:00
TIME END:	17:30

Project No: BC200153.03

Recorded By: DP

Project/Site: CS Energy Callide

Other Field Staff: Mike W

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Sample wells and surface water locations
- Complete Weed and Seed clean

Equipment in use:

- YSI
- IP
- LV
- Submersible pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DAILY LOG

26/10/22

DATE:	~~26/10~~
TIME START:	7:00
TIME END:	17:30

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start work at 7:00, contact Luke
- Collect surface water samples in the morning, WCWD inaccessible due to thick vegetation
- Get pump connector fixed in town and sampled RN13030692 at 15:00
- Completed Weed and Seed washdown at ~~[illegible]~~ 17:30
- Finished work and contacted Luke

Daniel Papineau

DAILY LOG

DATE:	27/10/22
TIME START:	7:00
TIME END:	16:30

Project No: BC200153.03

Recorded By: DP

Project/Site: CS Energy Callide

Other Field Staff: Mike W

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

~~Collect~~ - Sample monitoring wells

Equipment in use:

- LV
- IP
- VSI
- Submersible Pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DAILY LOG

27/10/22

DATE:	~~27/10/22~~
TIME START:	7:00
TIME END:	16:00

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- ~~Start~~
- 7:00 - Start work, contact Luke
- Sampled MW49, MW40, MW79, MW70, MW80, MW69, ESC4, and L005-B01
- ~~After~~ Accessed Matt Brandt's property at ~~7:45~~ 8:00
- Finished work at 16:00, contacted Luke

~~Met with~~ Weed and seed certification signed off at 7:30

DAILY LOG

DATE:	28/10/22
TIME START:	7:00
TIME END:	12:15

Project No: BC200153.03

Recorded By: DP

Project/Site: CS Energy Callide

Other Field Staff: Mike W

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Sample monitoring wells

Equipment in use:

- LV
- IP
- YSI
- Submersible pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DAILY LOG

28/10/22

DATE:	~~28/10/22~~
TIME START:	7:00
TIME END:	17:15

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Started work at , contacted Luke
- Sampled ESC3, MW31, MW30 and MW11 with submersible pump, dropped hydrasleeve in MW32 when pump wouldn't work
- Finished work at 17:15

Daniel Lapreaik

DAILY LOG

DATE:	29/10/22
TIME START:	7:30
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: CS Energy Callide

Other Field Staff: Mike W

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Sample wells offsite

Equipment in use:

- VSI
- IP
- Submersible pump
- LV

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See Sirms			

DAILY LOG

DATE:	29/10/22
TIME START:	7:30
TIME END:	16:00

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start work at 7:30 . contacted Luke
- Sampled MW73, RN13030698, MW43, MW72, RN13030126
- purged ~~RN13030~~ dry RN13030697 due to slow recharge at 10:30 15:30
- Returned to RN13030697 at ~~17:00~~, not enough water column left to sample (very slow recharge)
- Finish work at 16:00 contacted Luke

Attempted to sample RN13030112, string tore around collar of hydrasleeve, could not recover hydrasleeve from bottom of well. String was likely cut by the kink in the bore

Daniel Popineau

DAILY LOG

31/10/22

DATE:	~~31~~
TIME START:	9:00
TIME END:	17:00

Project No: BC2@153.03 + BCL220033.01

Recorded By: DP

Project/Site: CS Energy Callide

Other Field Staff: Emily M

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- ~~Collect ch~~ Sample monitoring wells
- ~~Find~~ Meet up with Sally to discuss plan for field works with Emily
- Called samples from stockpiles in FTG

Equipment in use:

- ~~3~~ -LV
- IP
- YSI

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DAILY LOG

DATE:	31/10/22
TIME START:	~~9:00~~ 10:00
TIME END:	17:00

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start work at 10:00, contact Luke
- Collected hydrasleeve ~~[illegible] MW32~~ from MW32
- Tried to drop hydrasleeve in RN13030112, couldn't drop hydrasleeve below screen without it getting stuck
- Met Sally at CS Energy at 13:00, completed induction to get access to FTG
- Cooling tower broke at power plant around 13:30
- Could not sample stockpiles due to time constraints with Enviro Pacific, will sample another day
- Left site at ~~[illegible]~~ ~16:40, contacted Luke

Daniel Popnicoski

DAILY LOG

DATE:	1/11/22
TIME START:	7:15
TIME END:	16:50

Project No: BC200153.03

Recorded By: Daniel Papineau

Project/Site: CS Energy Callide

Other Field Staff: Emily M

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

Sample MW75 and L006-B05

Equipment in use:

- LV
- YSI
- IP

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DAILY LOG

DATE:	1/11/22
TIME START:	~~7:30~~ 7:15
TIME END:	16:50

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Very rainy in morning
- Start work at 7:15, contact Luke
- Sample C006-B05 and collect hydrasleeve from MW75
- Additional samples requested from Callide A due to rain, Callide A NSP and SW42 sampled, water quality readings taken from R2
- Samples from 24/10/22 to 31/10/22 couriered to ALS and COC prepared
- Finish work on site at ~~1655~~ 16:45, contact Luke

Daniel Papworth

DAILY LOG

DATE:	2/11/22
TIME START:	7:00
TIME END:	16:30

Project No: ~~BC200153~~ BC200153.03

Recorded By: DP

Project/Site: CS Energy Callide

Other Field Staff: Emily M

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Sample SW41 at Sunwater property
- Sample monitoring wells

Equipment in use:

- LV
- ~~YSI~~ YSI
- IP
- Submersible pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

epic ENVIRONMENTAL

DAILY LOG

DATE:	2/11/22
TIME START:	7:00
TIME END:	16:30

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- ~~SW41 sampled~~
- Start work at 7:00, Luke contacted
- Meet up with Sunwater people outside their property at 7:45, escorted to SW41 to be sampled at 8:00
- Sampled wells MW68, MW76, MW74, MW56 and MW77
- Hydrasleeves collected from MW74 and MW76 and sampled
- Hydrasleeves dropped in RN1303027 and RN1303697, pump not strong enough to sample these wells with their small water columns
- Finished work at ~ 16:30, contacted Luke

Daniel Papineau

DAILY LOG

DATE:	3/11/22
TIME START:	7:30 ~~7:00~~
TIME END:	~~5:00~~ 10:00

Project No: BC200153.03

Recorded By: DP

Project/Site: CS Energy Callide

Other Field Staff: Emily M

Project Manager: Luke Ames

Contractors:

PRE START

Planned tasks for the Day:

~~Complete~~ Sample landholder bores and monitoring wells

Equipment in use:

- Submersible pump
- IP
- YSI
- LV

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
	See	SWMS			

DATE:	3/11/22
TIME START:	7:30
TIME END:	17:00

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Checked in with Luke when leaving accommodation
- ~~for~~ sampled LO12, LO21, MW09, RN13030127, RN13030697, SW37, and MW78
- Hydrasleeves collected and sampled from RN13030127 and RN13030697
- Deployed hydrasleeve in MW01 at ~~[illegible]~~ ~13:00
- ~~Left site at 16:~~
- Left site at 15:00
- Finished work offsite at 17:00, checked out with Luke

Daniel Paynter

DAILY LOG

DATE:	4/11/22
TIME START:	~~7:45~~ 7:45
TIME END:	~~12:30~~ 21:00

Project No: BC200153.03 + BCL220033.01

Recorded By: DP

Project/Site: CS Energy Callide

Other Field Staff: Emily M

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

~~Collect TB1~~

- Sample MW01
- Collect samples from stockpiles at FTG
- Demob

Equipment in use:

- LV
- YSI
- IP

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	4/11/22
TIME START:	7:45
TIME END:	21:00

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start work at 7:45 - contacted Luke
- Hydrasleeve collected from MW01
- Collected samples from stockpiles of crushed rock in the FTG
- ~~Dropped off samples and~~ 12:00 - finished COC for remaining samples and dropped off equipment, left site
- Arrived in Gladstone at ~ 14:30
- Arrived home at ~ 20:00

Daniel Lapinski

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	CALLIDE - QUARTERLY MONITORING	Well No:	MW01
Job No:	BC200153.03	Date:	H/S Deployed: 03/11/22 / H/S Pulled 04/11/22
Recorded By:	AM / DP	Time:	@13:00 / @9:00
Weather:	03/11/22 = Sunny 24°c. / 04/11/22. Sunny 17°		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	21.0
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	27.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):	—	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☑ Other	Hydrasleeve
Water Level Depth (WL in m BTOC):	2.12	Initial Pump Rate (L/min)	—
DNAPL Level Depth (DL in m BTOC):	—	**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	22m
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☑ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity Colour	TDS colour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	~~ppm~~	% Sat	NTU	_____	_____	°C
9:00	H/S	—	—	6.26	22711	93.0	0.85	11.0	—	SLIGHT ASH	nil	23.7
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour): USED HYDRASLEEVE

NO TUBING LEFT IN WELL

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD HYDRASLEEVE

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☑ Other ☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW01	—	—	RB_0411	FB-0411
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	QUARTERLY CALLIOP- MONITORING	Well No:	MW09
Job No:	BC200153-03	Date:	3/11/2022
Recorded By:	EM/DP	Time:	11:45
Weather:	SUNNY, WARM 20°C		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☑ PVC ☐ SS _ Other: OUTER CASING = STEEL	Screen Interval – Top (m BTOC)	7.0
Well Head Condition:	PVC = GOOD, STEEL = RUSTY.	Screen Interval – Bottom (m BTOC)	10.0

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	—
Water Level Depth (WL in m BTOC):	6.28
DNAPL Level Depth (DL in m BTOC):	—
Total Depth of Well (TD in m BTOC):	10.15
Height of Standing Water Column (TD-WL, in m):	3.87

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC): 9.5m @ 9.4 INITIAL AMPERAGE

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	(100)	3.87	3.5	13.54	40.63
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	~~Salinity~~ colour	~~TDS~~ odour	Temp.	PUMP RATE
HH:MM	L	-	µS/cm	mV	~~ppm~~	% Sat	NTU			°C	
6.56 12:04	1	6.88	16500	-12.4	1.91	24.1	—	MILKY GREY/BROWN	—	25.7	9.4
6.70 12:14	10	6.66	15090	26.7	0.73	9.2	—	" "	—	25.2	" "
12:20 * EM ON	11	6.62	14975	54.2	0.65	8.2	—	" "	—	25.3	" "
12:22 "	12	6.62	14892	58.7	0.62	7.8	—	" "	—	25.4	" "
12:24 "	13	6.61	14815	61.2	0.60	7.6	—	" "	—	25.4	" "
12:26 "	14	6.61	14745	64.1	0.59	7.5	—	" "	—	25.4	" "
12:28 "	15	6.61	14685	67.4	0.61	7.5	—	" "	—	25.4	✓
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-	
Results Acceptable? Y/N		✓									

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): * COULDN'T BALANCE RECHARGE AFTER 10L PURGED, SWITCHED TO LOW FLOW

SAMPLE COLLECTED AFTER 15L PURGED

Discharge water disposal: ☐ Drums _ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW09				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW11
Job No:	BC200153.03	Date:	28/10/22
Recorded By:	DP	Time:	14:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	—
Water Level Depth (WL in m BTOC):	3.57
DNAPL Level Depth (DL in m BTOC):	—
Total Depth of Well (TD in m BTOC):	8.39
Height of Standing Water Column (TD-WL, in m):	

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC):

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	4.9	3.5	17.15	52
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L ~~ppm~~	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV		% Sat	NTU			°C
SWL 3.09	0	6.81	9668	-66.2	0.43	5.3		clear	none	22.9
3.09 14:14	20	6.87	9031	-57.3	0.11	1.0		clear	none	22.9
3.74 14:22	40	6.87	9018	-28.9	0.02	0.3		clear	none	23.0
" 14:26	50	6.87	9023	-25.8	—	—		clear	none	23.0
" 14:30	60	6.87	9027	-23.0	—	—		clear	none	23.0
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW11				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Gallide Qtly	Well No:	MW13
Job No:	BC200153.03	Date:	28/10/22
Recorded By:	DP	Time:	12:00
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor / Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	6.93
DNAPL Level Depth (DL in m BTOC):	~~7.80~~
Total Depth of Well (TD in m BTOC):	7.80
Height of Standing Water Column (TD-WL, in m):	0.87m

	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
Minimum Purge Volume Required	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - $[\pi r(casing)^2 + 0.3 \times (\pi r(annulus)^2 - \pi r(casing)^2)$

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

WELL PURGING

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC):

Purged dry? ☐ No ☐ Yes, at _____ L

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	* no sample collected *									
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Insufficient water column

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Mty	Well No:	MW30
Job No:	BC2.00153.03	Date:	28/10/22
Recorded By:		Time:	12:26
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	6.00
Well Head Condition:		Screen Interval – Bottom (m BTOC)	9.00

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	5.01 m	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	8.93m	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	~~ppm~~	% Sat	NTU	_____	_____	°C
	0.5	6.60	3002	24.3	2.30	30.2		clear	none	26.8
13:03	1	6.61	2864	11.2	1.39	17.7		clear	none	25.9
13:05	~~1.5~~ 2	6.59	~~2840~~	14.4	1.33	16.5		clear	none	26.0
13:07	3	6.58	2823	16.0	1.24	15.5		clear	none	26.1
13:09	4	6.57	2814	16.7	1.18	14.6		clear	none	25.9
13:11	5	6.57	2805	17.8	1.07	132		clear	none	26.1
13:13	6	6.56	2803	18.9	0.99	12.8		clear	none	26.0
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Low flow pumped the well

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW30				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calide Qtly	Well No:	MW31
Job No:	BC200153.03	Date:	28/10/22
Recorded By:	DP	Time:	9:30
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	—
Water Level Depth (WL in m BTOC):	5.91
DNAPL Level Depth (DL in m BTOC):	—
Total Depth of Well (TD in m BTOC):	13.0
Height of Standing Water Column (TD-WL, in m):	7.09

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC):

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	7.09	3.5	25	75
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
								Colour	odour	
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
9:30	0	6.84	4062	-21.1	2.24	27.7		clear	none	25.4
9:41	~~20~~ 10	6.86	4034	8.4	1.27	15.9		clear	none	25.9
9:42	~~40~~ 11	6.87	3999	11.7	1.11	13.4		clear	none	26.2
9:44	~~60~~ 12	6.88	3968	19.8	1.02	12.8		clear	none	26.2
9:46	13	6.89	3918	25.8	0.95	11.9		clear	none	26.5
9:47	14	6.89	3910	26.6	0.90	11.3		clear	none	26.5
	~~15~~									
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Sink (mm)

6.45
~~6.45~~
6.45
6.45
6.45
6.45

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Swapped to low flow @ 9:41 ~~was pumping slow~~

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW31				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Kallida Monitoring	Well No:	MW32
Job No:	B2001501	Date:	28-10-22
Recorded By:	MW IDD	Time:	0800
Weather:	HOT	SAMPLE COLLECTED 31/10/22 @ 12:00	

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	22.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	25.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☑ Other	
Water Level Depth (WL in m BTOC):	28/10: 15.48 / 31/10: 15.45	Initial Pump Rate (L/min)	—
DNAPL Level Depth (DL in m BTOC):	—	PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	25.64	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):	10.19	Purged dry?	(No) ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	~~Salinity~~ Odour	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
HS			10.19	6.31	738.1	59.7	0.77	10.3	—	H_2S		30.5
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):
Couldn't pump, tried different voltages for 30 mins, swapped to hydrasleeve @ 23.5m

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calliide Mornings	Well No:	MW40
Job No:	Bc200153.03	Date:	27/10/22
Recorded By:	NW/DP	Time:	1400
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	—
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	—

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	4.69	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):	18.4	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO ~~ppm~~ mg/L	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV		% Sat	NTU	_____	_____	°C
				6.95	8718	-43.9	2.70	34.1				16.6
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Used hydrasleeve

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW40				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Monitoring	Well No:	MW43
Job No:	PE200153.03	Date:	29-10-20
Recorded By:	MW / DP	Time:	1330
Weather:	HOT		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	20.4
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	30.4

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):	—	☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	10.17	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):	—	PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	30.54	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
Minimum Purge Volume Required	50	100	20.37	3.5	71.2	213
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.S

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity Colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	~~ppm~~	% Sat	~~NTU~~			°C
	1	6.47	6026	-143.5	0.96	12.1	—	Red/Grey	H_2S	28.7
	4	6.54	6145	-162.8	1.36	16.7	—	~~Clear~~ "	H_2S	28.6
10.89	6	6.65	6304	-204.7	0.82	10.3	—	Cloudy	~~Nil~~	28.6
10.89	8	6.64	6487	-202.9	0.71	9.3	—	Cloudy	H_2S	29.2
	10	6.63	6536	-194.4	0.65	8.6	—	Clear	Nil	29.4
10.89	12	6.60	6525	-184.1	0.60	7.9	—	"	"	29.4
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): low flow!

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW43	—	—	RB01-2910	
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Monitoring	Well No:	MW49
Job No:	Bc200153.-3	Date:	27/10/22
Recorded By:	MW	Time:	1430
Weather:	HOT		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	—
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	—

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	8.54	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	19.60	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	~~ppm~~	% Sat	NTU	_____	_____	°C
				6.72	17703	-31.2	1.01	13.3				26.8
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

USED HYDRASLEEVE

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW49				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	CALLIDE QUARRY	Well No:	MW56
Job No:	BC200153.63	Date:	02/11/22
Recorded By:	EM/DP	Time:	10:10
Weather:	Sunny, 24°C		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	—
Well Head Condition:	Top - Good condition.	Screen Interval – Bottom (m BTOC)	—

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):	—	☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	—	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):	—	**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):	—	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):	—	Purged dry?	☑ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	/	3.5	/	/
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO ~~ppm~~ mg/L	DO	Turbidity	~~Salinity~~ COLOUR	~~TDS~~ ODOUR	Temp.
HH:MM	L	-	µS/cm	mV		% Sat	NTU			°C
10 mins	—	6.98	9756	537.3	4.7	60.2	—	CLEAR	NIL	25.1
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Same as purge method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW56	BD05-0211	SD05-0211	—	—
Analysis/ Bottles					

* NEW TUBING LEFT IN WELL

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	CALIDE – QUARTERLY MONITORING	Well No:	MW68
Job No:	BE220153.03	Date:	02/11/22
Recorded By:	EM/DP	Time:	12:50
Weather:	HOT, SUNNY 28°		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS _ Other:	Screen Interval – Top (m BTOC)	9.0
Well Head Condition:	GOOD	Screen Interval – Bottom (m BTOC)	18.0

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	—
Water Level Depth (WL in m BTOC):	9.11
DNAPL Level Depth (DL in m BTOC):	—
Total Depth of Well (TD in m BTOC):	16.36
Height of Standing Water Column (TD-WL, in m):	7.25

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC): PUMP @ 14.5m 11.6V PUMP RATE

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	7.25	3.5	25.37	76.11
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L ~~ppm~~	DO	Turbidity	~~Salinity~~ Colour	~~TDS~~ Odour	Temp.
HH:MM	L	-	µS/cm	mV		% Sat	NTU			°C
13:18	1	6.79	8838	122.3	0.68	9.4	—	BROWN	NIL	24.6
13:25	20	6.73	8803	115.6	0.22	2.7	—	" "	" "	23.8
13:31	40	6.69	8791	107.7	0.11	1.3	—	LIGHT BROWN	" "	23.8
13:37	60	6.66	8822	101.3	0.02	0.3	—	~~CLEAR~~	" "	23.8
13:44	80	6.65	8833	95.8	0.01	0.1	—	" "	" "	23.8
13:51	100	6.65	8836	93.8	0.01	0.1	—	" "	" "	23.8
	SAMPLE	COLLECTED	@	100L.						
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

EWL 9.10 " " " " " " " "

PUMP RATE 11.6 12.0 " " " " " " ✓

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): measured total well depth less than screen interval depth, possibly due to sediment?

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW68			RB_0211 / FB_0211	
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Gallide Qtly	Well No:	MW69
Job No:	BC200153.03	Date:	27/10/22
Recorded By:	DP	Time:	10:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS _ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	12.08
DNAPL Level Depth (DL in m BTOC):	16.287
Total Depth of Well (TD in m BTOC):	
Height of Standing Water Column (TD-WL, in m):	

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC):

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	4.2	3.5	14.7	44.1
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL (m)	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity colour	TDS odour	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
12.20	10:16	0	6.64	1008	118.7	3.37	44.2		Brown	none	28.1
12.20	10:30	10	6.46	1030	97.6	2.16	27.7		clearing	none	28.0
12.20	10:41	20	6.43	1024	74.0	0.63	7.7		clear	none	25.6
12.20	10:50	30	6.42	1010	46.3	0.21	2.5		clear	none	25.6
12.20	10:59	40	6.41	1018	39.7	0.06	0.8		clear	none	25.6
12.20	11:04	~~45~~	6.41	1017	38.8	0.05	0.7		clear	none	25.6
12.20	11:10	50	6.41	1011	37.5	0.04	0.6		clear	none	25.6
	Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
	Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	~~BE69~~ MW69			RB01_2710	
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Gallide Monitoring	Well No:	MW70
Job No:	Pc 200153.03	Date:	27/10/22
Recorded By:	MW	Time:	8:30
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	_ PVC ☐ SS _ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):	—	☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	9.57	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):	—	**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	16.40	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
Minimum Purge Volume Required	50	100	6.83	3.5	23.9	72
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
					mg/L			Colour	Odour	
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
	0	7.02	1175	-73	0.42	7.0		Brown	H_2S	25.4
	20	6.71	905	-35.9	0.12	1.4		Brown	H_2S	24.5
8:52	40	6.54	884	-17.4	0.10	1.2		Clear	none	24.5
8:58	60	6.44	869	-5.0	0.07	0.2		Clear	none	24.5
9:04	80	6.40	863	0.7	0.01	0.1		Clear	none	24.5
9:07	90	6.39	860	1.6	—	—		clear	none	24.6
9:10	100	6.39	855	3.1	—	—		Clear	none	24.6
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

SWL (m)
4.65
9.65

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW70				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Monitoring	Well No:	MW72
Job No:	Bc200153.03	Date:	24-10-22
Recorded By:	MW	Time:	1235
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☒ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	8.5
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	17.5

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	11.77	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):	—	**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	17.41	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):	5.71	Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	5.71	3.5	19.9	59.95
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity Colour	TDS Odour	Temp.
HH:MM	L	-	µS/cm	mV	~~ppm~~	% Sat	NTU			°C
	0	6.79	773	89.9	1.30	20.3	-	Clear	Nil	24.8
	20	6.51	729	92.7	0.71	8.0	-	"	"	21.0
	40	6.52	727	88.9	0.80	9.0	-	"	"	21.0
	60	6.52	724	89.4	0.75	8.3	-	"	"	20.8
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW72	—	—		
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Monitors	Well No:	MW73
Job No:	Bc200153-03	Date:	29-10-22
Recorded By:	MW/DP	Time:	11:20
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	10
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	19

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	11.80	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	17.56	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):	5.76	Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	5.70	3.5	20.16	60.46
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L ~~ppm~~	DO	Turbidity	Salinity Colour	TDS Odour	Temp.
HH:MM	L	-	µS/cm	mV		% Sat	NTU			°C
	0	6.82	1750	-18.5	2.10	27.3	—	Cloudy	Nil	29.4
	20	6.19	1623	43.4	1.62	15.8	—	Cloudy	Nil	26.1
	40	6.23	1605	47.2	—	—	—	"	"	25.4
	60	6.23	1592	49.7	0.02	0.2	—	Clear	"	25.4
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW73				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calide Qtly	Well No:	MW74
Job No:	BC200153.03	Date:	25/10/22 (DROPPED) ~~2.~~ 02/11/22 (COLLECTED)
Recorded By:	DP	Time:	9:30 (COLLECTED)
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	17.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	26.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):	—	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	10.9	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):	—	PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	27.83	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):	16.93	Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO ~~mg/L~~ ~~ppm~~	DO	Turbidity	~~Salinity~~ Colour	~~TDS~~ Odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV		% Sat	NTU			°C
H/S	—	—		7.04	2566	-50.9	0.69	8.3	—	CLEAR	H_2S	23.8
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

used hydrasleeve

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW74.				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Collide Qtly	Well No:	MW75
Job No:	BC200153.03	Date:	HS dropped 25/10/22 / HS collected 1/11/22
Recorded By:	DP	Time:	HS sample collected @ 9:45am
Weather:	Hot on 25/10/22 1/11/22 = Rainy		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	3.00
Well Head Condition:	GOOD	Screen Interval – Bottom (m BTOC)	20.00

WELL PURGING

PURGE VOLUME		PURGE METHOD H/S	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☑ Other	
Water Level Depth (WL in m BTOC):	4.99	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	22.44	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☑ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	~~Salinity~~ odour	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
HS	-	-		6.55	19571	97.4	0.88	11.6	SLIGHT ASH	NIL	—	24.7
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

USED HYDRASLEEVE

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW75				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	CALTEX QUEENSLAND	Well No:	MW76
Job No:	BE200153-03	Date:	H/S DROPPED 27/10/22 H/S COLLECTED 01/11/22
Recorded By:	EM/DP	Time:	@ 11:50
Weather:	HOT, SUNNY 28°C.		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	20.5
Well Head Condition:	GOOD	Screen Interval – Bottom (m BTOC)	26.5

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	19.42m	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☑ No ☐ Yes, at _____ L	Hydrasleeve

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity colour	TDS colour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	~~ppm~~	% Sat	NTU			°C
H/S	—	—	—	7.64	8826	-15.2	0.44	5.7	—	NIL	GREY	26.9
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

ASH SEDIMENT @ BOTTOM OF HYDRASLEEVE USED HYDRASLEEVE

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW76				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	CALLIDE QUARRY	Well No:	MW77
Job No:	BC200153-03	Date:	02/11/2022
Recorded By:	EM/DP	Time:	10:46
Weather:	HOT Sunny 27°C		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	8.5
Well Head Condition:	GOOD	Screen Interval – Bottom (m BTOC)	11.5

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	6.80
DNAPL Level Depth (DL in m BTOC):	
Total Depth of Well (TD in m BTOC):	12.05
Height of Standing Water Column (TD-WL, in m):	5.25

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☑ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC):

Purged dry? ☑ No ☐ Yes, at _____ L @ 10.7 Pump rate

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	5.25	3.5	18.375	55.125
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity	TDS	Temp.	Pump RATE
HH:MM	L	-	µS/cm	mV	~~ppm~~	% Sat	NTU			°C	
7.00	11:08	1	7.00	13098	-8.1	0.69	7.8	~~CLEAR~~	H2S	Light Brown	23.6	10.7
7.00	11:14	20	6.73	12783	20.9	0.22	2.6	—	" "	CLEAR	23.6	" "
7.00	11:16	30	6.69	13150	46.1	0.14	1.9	—	NIL	CLEAR	23.6	" "
7.00	11:18	40	6.68	13147	52.7	0.14	1.8	—	NIL	CLEAR	23.5	" "
7.00	11:20	50	6.65	13154	63.2	0.11	1.4	—	" "	" "	23.5	" "
" "	11:22	60	6.65	13153	62.6	0.10	1.4	—	" "	" "	23.6	" "
	11:24	70	6.64	13153	65.2	0.9	~~0.91~~	—	" "	" "	23.6	" "
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-	
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Sample Collected @ 70 L.

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☑ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW77	BD06_0211	SD06-0211		
Analysis/ Bottles					

SHEET 1

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	CALLIDE – QUARTERLY MONITORING	Well No:	MW178
Job No:	BC200153.03	Date:	03/11/2022
Recorded By:	BM/DP	Time:	9:30
Weather:	SUNNY, WARM 26°C		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	14.2
Well Head Condition:	GOOD	Screen Interval – Bottom (m BTOC)	23.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):	—	☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	9.49	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):	—	PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	24.5	Depth (m BTOC): 16m 12.0v INITIAL PUMP RATE	
Height of Standing Water Column (TD-WL, in m):	15.01	Purged dry? ☐ No ☐ Yes, at _____ L	

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	(150)	15.01	6.5	97.56	292.68

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO ~~mg/L~~ ppm	DO	Turbidity	Salinity ~~ppm~~	~~TDS~~ ppm	Temp.
HH:MM	L	-	µS/cm	mV		% Sat	NTU			°C
9:45	1	6.6	10504	168.0	0.45	6.3	—	CLEAR	NIL	26.7
9:50	20	6.77	10760	141.5	0.16	1.9	—	CLEAR	NIL	25.0
9:58	40	6.84	10773	122.0	0.06	0.9	—	" "	" "	24.9
10:07	60	6.87	10829	108.5	—	0.0	—	" "	" "	25.2
10:16	80	6.89	10809	100.8	—	-0.4	—	" "	" "	25.0
10:24	100	6.90	10839	98.2	—	—	—	" "	" "	25.1
10:32	120	6.90	10817	94.9	—	—	—	" "	" "	25.0
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

PUMP RATE

9.49 " " " " " " " " " "

12v " " " " 11.8 " " " "

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples					
Analysis/ Bottles					

SHEET 2

~~LOW FLOW~~ GROUNDWATER SAMPLING FIELD SHEET

Job Name:	CALIDE-QUARTERLY MONITORING	Well No:	MW78
Job No:	BC200153-03	Date:	03/11/2022
Recorded By:	EM/DP	Time:	
Weather:	SUNNY, WARM, 20°C		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:	GOOD.	Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):		Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):	SEE SHEET 1	PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC): SEE SHEET 1	
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L	

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	~~Salinity~~ Colour	~~TDS~~ odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
10:40	140	—	—	6.91	10876	92.5	—	—	—	Clear	none	25.1
10:48	160	—	—	6.89	10863	91.9	—	—	—	"	"	25.1
10:56	180	—	—	6.90	10835	87.7	—	—	—	"	"	25.0
11:04	200	—	—	6.91	10850	87.1	—	—	—	"	"	25.1
11:12	220	—	—	6.91	10877	85.6	—	—	—	"	"	25.2
11:20	240	—	—	6.91	10910	82.9	—	—	—	"	"	25.3
11:28	260	—	—	6.91	10858	79.4	—	—	—	"	"	25.1
11:36	280	—	—	6.91	10908	77.4	—	—	—	"	"	25.1
11:44	300	—	—	6.91	10899	76.2	—	—	—	"	"	25.1 ✓
	~~320~~											
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N				✓	✓	✓						✓

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

SAMPLE COLLECTED AFTER 300L PURGED.

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW78				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide City	Well No:	MW79
Job No:	BC200153.03	Date:	27/10/22
Recorded By:	DP	Time:	13:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):		Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
				6.38	6352	-12.3	0.86	11.4				29.3
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Used hydrasleeve

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW79				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW80
Job No:	BL2001533.03	Date:	27/10/22
Recorded By:	DP	Time:	13:10
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):		Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	~~ppm~~	% Sat	NTU	_____	_____	°C
					900	-35.9	1.30	17.9	-			30.3
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Used hydrasleeve

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW80				
Analysis/ Bottles					

~~LOW FLOW~~ GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calliele Monitoring	Well No:	LOO5-BO1
Job No:	BE200153.03	Date:	27-10-22
Recorded By:	MW/DP	Time:	0800
Weather:	HOT		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☑ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☐ PVC ☑ ~~SS~~ ☐ Other:	Screen Interval – Top (m BTOC)	—
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	—

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☒ Other	
Water Level Depth (WL in m BTOC):		Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	~~ppm~~	% Sat	NTU	_____	_____	°C
		—	—	7.1	1689	129.7	4.62	57.1				25.0
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	LOO5-301	SD03_2710	SD03_2710		
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Collide Otly	Well No:	L006-BO5
Job No:	BC200153.03	Date:	01/11/22
Recorded By:	DP	Time:	8:30
Weather:	Rainy		

CONSTRUCTION INFORMATION

Well Type:	☒ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		_ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):		Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	_ No _ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO ~~ppm~~ mg/L	DO	Turbidity	~~Salinity~~ Odour	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV		% Sat	NTU			°C
10 mins				7.06	1560	70.7	5.64	66.9	—	nil	—	24.1
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	L006-BO5				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	KALIDE - QUARTERLY MONITORING	Well No:	L017 - B01
Job No:	BC200153.03	Date:	03/11/2022
Recorded By:	EM / DP	Time:	8:00
Weather:	Sunny, COOL 13°C		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☑ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	—
Well Head Condition:	HOSE TAP - GOOD CONDITION.	Screen Interval – Bottom (m BTOC)	—

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):		Initial Pump Rate (L/min)	—
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	—
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☑ No ☐ Yes, at _____ L	

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO ~~mg/L~~	DO	Turbidity	~~Salinity~~ Colour	~~TDS~~ Odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	~~ppm~~	% Sat	NTU	_____	_____	°C
10 mins	—	—	—	6.42	1365	144.4	0.71	8.0	—	CLEAR	NIL	22.2
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour): ~~BORE~~ Bore operated by landholder (Barry Caper). SAMPLE COLLECTED FROM HOSE CONNECTED TO BORE TAP

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD
☐ Same as purge method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	L017 - B01				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	CALLIDE - QUARTERLY MONITORING	Well No:	L021 - B01
Job No:	B02001153.03	Date:	03/11/2022
Recorded By:	EM / DP	Time:	8:45
Weather:	COOL, SUNNY 13°C		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☑ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☐ PVC ☐ SS ☐ Other: GARDEN TAP / HOSE	Screen Interval – Top (m BTOC)	—
Well Head Condition:	TAP - GOOD CONDITION	Screen Interval – Bottom (m BTOC)	—

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		_ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):		Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☑ No _ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	~~Salinity~~	~~TDS~~	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	~~ppm~~	% Sat	NTU	CALCULATE	CALCULATE	°C
10mins	—	—	—	6.63	443.7	146.7	2.61	31.4	—	CALCULATE	NIL	24.6
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

SAMPLE COLLECTED FROM TAP @ FRONT GATE

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☑ Other TAP ☐ Same as purge method ☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	L021-B01	—	—	—	
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Monitoring	Well No:	ESC3
Job No:	P200153.03	Date:	28-10-22
Recorded By:	MW/DP	Time:	1500
Weather:	HOT		

CONSTRUCTION INFORMATION

Well Type:	✓ Monitor ☐ Extraction Other:	Well Stick Up (m) (above/below ground level)	
Well Material:	☐ PVC ☑ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	—
Water Level Depth (WL in m BTOC):	12.62
DNAPL Level Depth (DL in m BTOC):	23.73
Total Depth of Well (TD in m BTOC):	
Height of Standing Water Column (TD-WL, in m):	11.11

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC): 20m

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	11.11	3.5	38.8	155.5
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL (m)	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity colour	TDS odour	Temp.
	HH:MM	L	-	µS/cm	mV	~~ppm~~	% Sat	NTU			°C
12.72		20L	6.91	8472	-72.8	0.49	4.3		clear	none	24.6
12.72		40L	6.91	8480	-3.3	0.04	0.5		clear	none	24.5
12.72		60	6.89	8532	11.2	—	—		"	"	24.5
12.72		80	6.88	8441	18.2	—	-0.4		"	"	24.3
12.72		100	6.88	8417	22.7	—	-0.9		"	"	24.4
		120	6.87	8400	30.0	—	—		"	"	24.3
✓		140	6.88	8405	33.5	—	—		"	"	24.2
	Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
	Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	ESC3			RB01-2810	
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	ESC4
Job No:	BC200153.03	Date:	27/10/22
Recorded By:	DP	Time:	13:40
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	6.33	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):	23.9	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
				7.70	8386	-2.4	0.8	10.9				29.4
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Used hydrasleeve

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD ☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	ESC4				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	CALLIDE MONITORING	Well No:	RN130112
Job No:	RC200153·03	Date:	31/10/22
Recorded By:	EM / DP	Time:	11:00
Weather:	HOT / SUNNY		

CONSTRUCTION INFORMATION

Well Type:	☒ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:	WELL CASING BENT	Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):	—	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	8.25m	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
* NO SAMPLE COLLECTED - HYDRASLEEVE STUCK TO WELL												
	~ 11m											
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	NIL				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calide QHG	Well No:	RN130320126
Job No:	BC25[illegible]03	Date:	29-10-22
Recorded By:	DP	Time:	0940
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	—
Water Level Depth (WL in m BTOC):	10.20
DNAPL Level Depth (DL in m BTOC):	19.20
Total Depth of Well (TD in m BTOC):	
Height of Standing Water Column (TD-WL, in m):	9.0

PURGE METHOD

☐ Bailer Type: PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC):

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	~~19~~ 9.0	3.5	31.5	94.5
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	~~ppm~~	% Sat	~~NTU~~			°C
	0	6.83	440	-53.6	0.60	5.8		clear	Nil	27.5
0957	20	6.48	520	24.3	0.09	0.2		"	"	24.7
10:02	40	6.45	518	43.8	—	—		"	"	24.7
10:07	60	6.43	517	46.2	0.01	0.1	—	"	"	24.7
	80	6.44	516	52.1	0.01	0.1	—	"	"	24.7
	100	6.44	519	54.0	—	—		"	"	24.7
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN130320126				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	CALLIDE - QUARTERLY MONITORING	Well No:	RN1303127
Job No:	BC200153.03	Date:	03/11/22 @ 15:15 (after H/S) / 02/11/2022 deployed H/S
Recorded By:	EM/DP	Time:	15:00
Weather:	Sunny, HOT 26°C (02/11/22) / Sunny, 29°C (03/11/22)		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☑ SS ☐ Other:	Screen Interval – Top (m BTOC)	11.00
Well Head Condition:	GOOD - SLIGHT RUST	Screen Interval – Bottom (m BTOC)	15.80

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	—
Water Level Depth (WL in m BTOC):	10.26
DNAPL Level Depth (DL in m BTOC):	—
Total Depth of Well (TD in m BTOC):	15.48
Height of Standing Water Column (TD-WL, in m):	5.22

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC): 15.0 @ 12.3V MIDAR PUMP RATE

Purged dry? ☐ No ☐ Yes, at _____ L

	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
Minimum Purge Volume Required	50	100	5.22	3.5	18.27	54.81
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	~~Salinity~~	~~TDS~~	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
SWL										PUMP RATE
10:26	15.22 (02/11)	6.95	980	-80.0	1.24	15.5	—	Brown	ORGANIC	24.0 12.3
13:05	15:32 → Water stopped pumping after 5L @ 12.3V purged. Retrieved pump to clean and dropped down again to 15m and still not able to pump any water @ 12.3v. Hydrasleeve deployed @ 14.5m. (16:15 03/11)									
11.41 ✱	15:15 (03/11) H/S	7.08	814	5.9	2.57	30.3	—	Brown	ORGANIC	23.9 —
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): ✱ RETURNED 03/11/22 @ 15:15 to retrieve H/S

Discharge water disposal: ☐ Drums ☐ Other: TUBING LEFT IN WELL

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☑ Other Hydrasleeve ☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN1303127				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Monitoring	Well No:	RN13030692
Job No:	Bx20015303	Date:	26/10/22
Recorded By:	MW / DP	Time:	14:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	Monitor ☐ Extraction Other: ✓	Well Stick Up (m): (above/below ground level)	
Well Material:	✓ PVC ☐ SS _ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	9.68	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	17.02	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
Minimum Purge Volume Required	50	100	7.34	3.5	25.7	78L
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO 2.88	DO	Turbidity	~~Salinity~~ Colour	~~TDS~~ odour	Temp.	SWL m
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C	
14:27	0	6.99	453.1	-46.1	~~2.99~~	33.6		clear	mild H2S	26.0	9.68
14:39	20	6.47	468.1	30.8	1.63	20.2		clear	none	~~26.0~~	9.68
14:52	40	6.39	466.7	28.7	1.36	16.7		clear	none	25.6	9.68
15:06	60	6.35	465.3	32.2	1.32	16.2		clear	none	25.7	9.68
	80	6.34	468.7	31.9	1.27	16.0		clear	none	25.6	9.68
	85	6.34	470.8	32.1	1.24	15.5		clear	none	25.6 ✓	
	~~72~~										
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-	
Results Acceptable? Y/N											

25.7

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN13030692				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Monitoring	Well No:	RN130306 97
Job No:	Bc200153.03	Date:	29/10/22 Purge day.
Recorded By:	MW IDP	Time:	1038
Weather:	Hot	SAMPLE COLLECTED on ~~31/10/22~~ 03/11/22 @ 15:30 ~~11:30~~	

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	12.7
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	13.7

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):	—	☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	9.49 @purge	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):	12.17	**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):	2.68	Purged dry? ☐ No ☐ Yes, at _____ L

31/10/22 10.75m@ ~~purge~~

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	2.68	3.5	9.38	28.14
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

SWL

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	1. Purged dry - Return to Sample.									
Dry 10.75	2. Returned to sample on 31/10/22 – not enough recharge volume to purge									
10.71	* 3. Returned 02/11/22 and deployed a hydrasleeve @ 11.5m (16:30pm)									
	4. Returned 03/11/22 to retrieve Hydrasleeve @ 15:30pm									
15:50	H/S	6.93	1214	-79.0	1.36	16.5				24.3
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): unable to stop drawdown, Purged Dry 29/10/22 – 1100
Discharge water disposal: ☐ Drums ☐ Other: * measured total depth of well (12.17) less than ~~bottom~~ top of screen interval (12.7)

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples					
Analysis/ Bottles					

0.51
12.17

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide	Well No:	RN13030698
Job No:	Bc200153.03	Date:	29-10-22
Recorded By:	MW/DP	Time:	0806
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	Monitor / Extraction Other:	Well Stick Up (m): (above/below ground level)	—
Well Material:	/ PVC SS Other:	Screen Interval – Top (m BTOC)	17.2
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	18.2

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	—
Water Level Depth (WL in m BTOC):	7.96
DNAPL Level Depth (DL in m BTOC):	
Total Depth of Well (TD in m BTOC):	19.00
Height of Standing Water Column (TD-WL, in m):	11.04

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	11.04	3.5	38.6	115.9
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - $[\pi r(casing)^2 + 0.3 \times (\pi r(annulus)^2 - \pi r(casing)^2)$

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

PURGE METHOD

☐ Bailer Type: PVC SS Teflon Other

☐ Pump Type: Submersible Bladder Peristaltic Other

PUMP INTAKE SETTING

Depth (m BTOC): 17.7

Purged dry? ☐ No ☐ Yes, at _____ L

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO mg/L	DO	Turbidity	Salinity Odour	TDS Colour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
SWL	0	7.34	1975	113.2	0.92	11.0	—	Nil	Cloudy	24.0
7.97 8:33	20	6.98	1972	122.9	0.76	8.9	—	nil	Clear	23.8
8:38	40	6.78	1954	127.0	0.68	8.0	—	none	Clear	23.3
	60	6.74	1945	126.1	0.67	7.8	—	Nil	Clear	23.5
	80	6.69	1943	126.5	0.62	7.4	—	"	"	23.8
	100	6.67	1940	125.2	0.64	7.4	—	"	"	23.8
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: PVC SS Teflon Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible Bladder Other

SAMPLE DISTRIBUTION:	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN13030698	SD04-2910	SD04-2910		
Analysis/ Bottles					

SURFACE WATER FIELD MONITORING SHEET

Job Name:	Callide Qtly		Recorded By: DP
Job number:	BC200153.03		Date: 26/10/22

Sampling Data

Sample ID	QAQC ID	Field Parameters (Specify Units)							
		NTU	pH	EC	°C	Redox	TDS	DO %	DO mg/L
SW34			6.85	460.9	27.3	-83.7		7.4	0.58
PW1			8.06	9327	28.8	30.1		68.0	5.10
SW40			6.78	720	24.0	119.2		17.4	1.46
SW32		7.33 → ~~8.66~~		2144	22.1	94.6		65.6	5.56
SW22		687	7.68	~~1~~	24.1	103.7		52.1	4.37
SW2			7.51	529	23.3	102.3		45.2	3.86
SW20			8.27	371.3	28.2	83.0		95.4	7.43
SW36			8.63	360.2	30.5	85.6		100 *	7.91
SW13			7.46	12500	27.9	58.3		100 *	8.36
Borrow Pit A			7.69	35186	32.5	32.8		76.2	4.94
PW2			8.04	10509	27.7	28.7		81.3	5.98

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	
					* readings over 100%

SURFACE WATER FIELD MONITORING SHEET

Job Name:	Callide Qtly		Recorded By: DP
Job number:	BC200153.03		Date: 25-26/10/22

Sampling Data

Sample ID	QAQC ID	Field Parameters (Specify Units)							
		NTU	pH	EC	°C	Redox	TDS	DO %	DO mg/L
Callide A	ESP		7.85	215	33.8	55.2		100*	7.13
Notch-V1	BD02/SD02_2510		7.48	17568	32.3	52.7		99.8	6.63
Notch-V2	BD01/SD01_2510		7.74	15938	30.6	41.6		100*	7.26
ORD	.....	—	7.84	9576	29.8	111.7		154.8*	10.96

7/10/22

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	
					* readings over 100%

SURFACE WATER FIELD MONITORING SHEET

Job Name:	CALLIDE - CS ENERGY		Recorded By:	EM/DP
Job number:			Date:	01/11/22 @ 15:20

Sampling Data

Sample ID	QAQC ID	Field Parameters (Specify Units)						
		NTU	pH	EC	°C	Redox	TDS	DO mg/L
SW42	—	—	7.84	3040	28.1	120.2	—	5.97
* SW 44	-	—	7.30	122.2	31.0	105.8	—	2.68

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	
SW42	CLEAR	CLEAR.			SAMPLES COLLECTED FOR ANALYSIS.
SW 44	BROWN	MURKY			RAIN IN PREVIOUS 24HRS ~ 35mm

*SW44 = CALLIDE-A-NSP. SAMPLE ID.

SW44 SAMPLE COLLECTED FROM PONDED WATER (STILL)

SURFACE WATER FIELD MONITORING SHEET

Job Name:	CALLIDE - CS ENERGY.		Recorded By: EM / DP
Job number:			Date: 01/11/2022 @ 14:40

Sampling Data

Sample ID	QAQC ID	Field Parameters (Specify Units)						
		NTU	pH	EC	°C	Redox	TDS	$DO_{mg/L}$
R2	–		8.6	970	26.1	77.9		10.21

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	
					NO water observed at SW17 (DS of R2) and SW18 (US of R2). NO samples collected at R2 (WQm reading only)

SURFACE WATER FIELD MONITORING SHEET

Job Name: CALLIDE – QUARTERLY MONITORING		Recorded By: EM/DP.	
Job number:		Date: 02/11/22 @ 7:45	

Sampling Data

	Sample ID	QAQC ID	Field Parameters (Specify Units)						
			NTU	pH	EC µS/cm	°C	Redox	TDS	DO mg/L
02/11	SW41	—	—	7.75	628	23.6	105.9	—	5.40
03/11	SW37	—	—	7.54	2411	24.0	118.0	—	4.98

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	
SW41	BROWN/GREEN	TURBID			WEATHER: SUNNY, COOL 18°C. SW41: Algae present on surface and water following over weir.
SW37	BROWN/GREEN	TURBID			SW37 weather: Sunny, 24°C Algae present of surface, < 20cm deep - Evidence of cattle tracks and poo.

Banana Shire Council
62 Valentine Plains Road
Valentine Plains

PO Box 412
BILOELA QLD 4715

Telephone: 07 4992 9500
Facsimile: 07 4992 3493

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Website: www.banana.qld.gov.au

Banana SHIRE

5335

Vehicle/Machine Inspection Report Sheet

This is to confirm that the following vehicle/machine has been inspected and found to have been thoroughly cleaned in order to reduce the likelihood of transporting declared weed/seeds or matter.

VEHICLE/MACHINE DESCRIPTION

MAKE:	TOYOTA HILUX
TYPE:	4x4 DUAL CAB
REGISTRATION NO OR ENGINE/FRAME NO:	802 EY9
ODOMETER READING:	243 7KM
OWNER:	AVIS (EPK ENVIRONMENTAL) TO BE PAID BY CS ENERGY
INSPECTED AT:	BILOELA WASHDOWN BAY
INSPECTION DATE:	27-10-22
AUTHORISED INSPECTION OFFICER:	IAN NEILL-BALLANTINE

Authorised Inspection Officer's Signature: I. Neill-Ballantine

COMPANY DETAILS

Washdown Inspection Fee $ _____ ☑ Short Notice Inspection Fee $_____ ☐

Invoice to be issued to

OWNER/COMPANY NAME:	Sally Bulten (CS Energy)		
PHONE:		**MOBILE:** 0447 241 695	
EMAIL ADDRESS:	Sbulten@csenergy.com.au		
POSTAL ADDRESS:	95 Biloela Callide Road		
TOWN/SUBURB:	Dumgree	**STATE:** QLD	**POSTCODE:** 4715
SPECIAL REQUIREMENTS FOR INVOICING: eg. Purchase Order, Project/Task No			
NAME OF DRIVER:	Michael Whitty		

I confirm that the Owner/Company listed above will be responsible for payment of Council's fees and charges.

Driver's Signature: _____

PRIVACY COLLECTION NOTICE: Banana Shire Council is collecting your personal information for the purpose of a vehicle/machinery inspection. The information will not be disclosed to any other person or agency external to Council without your consent, unless required by or authorised by law. Personal information will be handled in accordance with the *Information Privacy Act 2009*.

Whilst Banana Shire Council has taken all care in the inspection of the above vehicle/machinery, neither Banana Shire Council nor its Officers or Staff accept any responsibility for any weed contamination which may occur as a result of any inaccuracy or omission from this inspection. The ultimate responsibility to ensure the parcel of land is free of all weed contamination rests with the owner of the vehicle/machinery.

THIS INSPECTION IS VALID ONLY AT THE DATE OF INSPECTION.

DAILY LOG

DATE:	27/2/23
TIME START:	4:00
TIME END:	16:00

Project No: BC20153.03

Recorded By: DP

Project/Site: Callide Qtly

Other Field Staff: Dane Lawrence (CS Energy Staff)

Project Manager: MCK

Contractors:

PRE START

Planned tasks for the Day:

- Mobilise to site

Equipment in use:

- LV
- Pump
- IP
- YSI

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Left home for airport at 4:00
- Arrived in Gladstone at ~7:30
- Arrived in Biloela at 10:00
- SWMS checked by Sally, met ~~Ben~~ Dare
- Performed surface water sampling until 15:45, then left site

Daniel Kapinowski

DAILY LOG

DATE:	28/2/23
TIME START:	7:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: Callide Qtly

Other Field Staff: DL

Project Manager: McK

Contractors:

PRE START

Planned tasks for the Day:

- Surface water sampling

Equipment in use:

- LV
- Sampling pole
- YSI

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Started at 7:00
- performed surface water sampling at:
  - SW20
  - SW36
  - SW12
  - SW2
  - DRD
  - PW1
  - SW43

other locations were dry / inaccessible, See surface water field sheets for info

- Finished on site at 16:00

David Papineau

DAILY LOG

DATE:	1/3/23
TIME START:	7:00
TIME END:	18:00

Project No: BC200153.03

Recorded By: DP

Project/Site: Callide Qtly

Other Field Staff: DL

Project Manager: MCK

Contractors:

PRE START

Planned tasks for the Day:

- Sample groundwater wells
- Drop hydrasleeves

Equipment in use:

- LV
- YSI
- Pump
- IP

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Started at 7:00
- pumped following wells:
  - RN13030692
  - RN13030698
  - MW77
  - MW40
- Dropped hydrasleeves at:
  - MW1
  - MW49
  - MW74
  - MW75
  - MW76
  - ESC4
- Finished at 16:00 on site

Daniel Pascual

DAILY LOG

DATE:	2/3/23
TIME START:	7:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: Calide QHy

Other Field Staff: DL

Project Manager: MCK

Contractors:

PRE START

Planned tasks for the Day:

Sample Wells

Equipment in use:

- LV
- IP
- Pump
- YSI

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start at 7:00, ~~rain~~
- Sampled:
  - MW74
  - ESC3
  - MW11
  - MW73
  - MW79
  - MW80

Note: Sharon Geall (CS Energy) accompanied me instead of Dare in the afternoon of the 3rd, and on the 6th and 7th of March

Left site at 16:00

Daniel Papworth

DAILY LOG

DATE:	3/3/23
TIME START:	7:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: Callide @ Hy

Other Field Staff: DL, SG

Project Manager: MCK

Contractors:

PRE START

Planned tasks for the Day:

- Pump wells

Equipment in use:

- LV
- IP
- Pump
- VSI

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See ~~See~~ SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start work at 7:00
- Sampled following wells:
  - MW43
  - MW68
  - ESC4
  - MW75
  - MW76
  - MW78
  - MW9
  - MW49
- Left site at 16:00

Daniel Popmeagh

DAILY LOG

DATE:	4/3/23
TIME START:	~~7:00~~ 8:00
TIME END:	~~16:00~~ 14:00

Project No: BC200153.03

Recorded By: DP

Project/Site: Callide Qtly

Other Field Staff: DL

Project Manager: MCK

Contractors:

PRE START

Planned tasks for the Day:

- Pump wells

Equipment in use:

- LV
- IP
- Pump
- YSI

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Started work at 8:00
- Sampled following wells:
  - L006 - B05
  - MW31
  - MW32
  - purged RN1303697 dry
- Finished work at 14:00

Daniel Papineau

DATE:	6/3/23
TIME START:	7:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: Callide Qtly

Other Field Staff: DL, SG

Project Manager: MCK

Contractors:

PRE START

Planned tasks for the Day:

- Pump wells
- Sample weir (SW41)

Equipment in use:

- LV
- IP
- YSI
- Pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- ~~Start~~
- Start work at 7:00
- Sampled following locations:
  - MW23
  - MW66
  - RN13030126
  - L02L-B01
  - RN13030697
  - SW41
- Left site at 16:00

Daniel Formed

DAILY LOG

DATE:	7/13/23
TIME START:	7:00
TIME END:	16:30

Project No: BC200153.03

Recorded By: DP

Project/Site: Callide Qtly

Other Field Staff: DL, SG

Project Manager: MCK

Contractors:

PRE START

Planned tasks for the Day:

- Sample wells
- re-attempt sampling SW22

Equipment in use:

- LV
- IP
- Sampling pole
- Pump
- YSI

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start work at 7:00
- Sampled following locations:
  - SW22
  - MW69
  - RN13030127
  - L005-1301
  - RN13030175
  - MW70
- Left site at 16:00

Daniel Papineau

DAILY LOG

DATE:	8/3/23
TIME START:	7:30
TIME END:	20:30

Project No: Bc200153.03

Recorded By: DP

Project/Site: Callide Mly

Other Field Staff: DL

Project Manager: MCK

Contractors:

PRE START

Planned tasks for the Day:

- Sample L012-B01
- Demobilisation

Equipment in use:

- LV
- YSI

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Started work at 7:30
- Sampled L012-B01 at 8:10
- Dropped off equipment and filled out COC, left site at 13:30
- arrived in Gladstone at 15:30, arrived in Brisbane at ~~19:45~~
- arrived home at 20:30

Daniel Pagincsk

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW1
Job No:	BC200153.03	Date:	2/3/23
Recorded By:	DP	Time:	10:30
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	21.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	27.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	1.54	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):		Depth (m BTOC): 23.0m
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	–	6.52	21775	-21.1	0.53	7.1	–	–	–	25.5
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve dropped 11:00 29/2/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW1			RB01_0203	
Analysis/ Bottles				↑	

taken from dipper

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW9
Job No:	BC200153.03	Date:	3/3/23
Recorded By:	DP	Time:	10:45
Weather:	Cloudy - hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	7.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	10.0

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	7.18
DNAPL Level Depth (DL in m BTOC):	
Total Depth of Well (TD in m BTOC):	10.24
Height of Standing Water Column (TD-WL, in m):	

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC): ~9m

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS Odour	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
7.50		0	6.89	11670	-34.5	1.66	20.4		cloudy	mild H2S	24.9
7.64	10:30	1	6.85	11602	-33.3	1.38	16.9		clearing	none	24.7
7.64	10:33	2	6.83	11559	-28.7	0.81	10.1		clearing	none	24.7
7.64	10:35	3	6.82	11534	-26.3	0.87	11.1		clear	none	25.1
7.64	10:37	4	6.82	11554	-26.0	0.72	9.1		clear	none	25.1 ✓
		~~3~~									
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Low flow pumped - slow recharge

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW9			RB01_0303	
Analysis/ Bottles				✓ taken from pump	

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW11
Job No:	BC20053.03	Date:	2/3/23
Recorded By:	DP	Time:	13:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	5.0
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	8.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	3.77	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	8.37	Depth (m BTOC): 7.0 m
Height of Standing Water Column (TD-WL, in m):	4.6	Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5	16	48
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		0	7.27	8979	-65.2	0.71	8.5	—	Grey	H_2S	23.3
3.78	13:10	10	7.00	8774	-55.4	0.29	3.4	—	clear	mild H_2S	23.0
3.79	13:13	20	6.97	8853	-48.4	0.22	2.5	—	clear	none	22.8
3.80	13:16	30	6.95	8855	-39.2	0.10	1.2	—	clear	none	22.9
3.80	13:19	40	6.95	8832	-36.1	0.08	1.0	—	"	"	22.9
3.80	13:21	50	6.9	8832	-30.9	—	—	—	"	"	22.8
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD ☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW11				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Mly	Well No:	MW13
Job No:	BC200153.03	Date:	3/3/23
Recorded By:	DP	Time:	13:45
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	6.97	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	7.85	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):	0.88	Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Insufficient water column for sampling

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	_____				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qty	Well No:	MW23
Job No:	BC200153.03	Date:	6/3/23
Recorded By:	DP	Time:	14:00
Weather:	Hot, Clear		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	~~5.51~~ 10.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	~~13.53~~ 13.0

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	5.51
DNAPL Level Depth (DL in m BTOC):	
Total Depth of Well (TD in m BTOC):	13.53
Height of Standing Water Column (TD-WL, in m):	8.02

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC):

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		84
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Color	TDS odor	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
5.72	13:56	~~20~~ 10	6.93	213	106.3	—	—		clear	none	24.4
5.72	13:58	20	6.91	217	108.2	—	—		"	"	24.2
5.72	~~13:~~ 14:02	40	6.89	223	107.8	—	—		"	"	24.3
	14:06	60	6.89	220	106.2	—	—		"	"	24.3
	14:08	70	6.88	219	105.3	—	—		"	"	24.3
	14:10	80	6.88	218	104.8	—	—		"	"	24.3
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW23				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calide Qtly	Well No:	MW30
Job No:	BC200153.03	Date:	3/3/23
Recorded By:	DP	Time:	~~13:30~~ 13:30
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
Minimum Purge Volume Required	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Well appeared to have collapsed, couldn't get anything past 1r

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	_____				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW31
Job No:	BC200153.03	Date:	4/3/23
Recorded By:	DP	Time:	9:50
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	11.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	14.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	5.41	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	13.15	Depth (m BTOC):	13m
Height of Standing Water Column (TD-WL, in m):	7.74	Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		81
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS Odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
10:01	0	7.12	3383	-45.2	0.12	1.4		Clear	H_2S	25.0
10:10	20	7.12	3063	-45.1	—	—		〃	none	24.9
10:20	40	7.29	2049	-34.2	—	—		〃	〃	24.5
10:30	60	7.29	2032	-30.7	—	—		〃	〃	25.2
10:35	70	7.29	1993	-27.3	—	—		〃	〃	25.2
10:40	80	7.30	1982	-25.8	—	—		〃	〃	25.2
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Same as purge method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW31			RB01_0403	
Analysis/ Bottles					

taken from dipper

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW32
Job No:	BC20153.03	Date:	4/3/23
Recorded By:	DP	Time:	9:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	22.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	25.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	15.51	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):	26	Depth (m BTOC):	24m
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
09:19	1		6339	-71.2	0.26	3.3		clear	H_2S	26.6
09:21	2		6265	-75.4	0.23	3.2		"	"	26.8
09:22	3	6.50	6329	-90.2	N/A	3.7		"	"	26.4
09:23	4	6.49	6338	-82.1	0.37	3.7		"	"	26.4
09:24	5	6.50	6375	-69.8	0.34	4.4		"	"	26.3
09:26	6	6.46	6397	-61.8	0.09	1.1		"	"	26.2
09:28	7	6.47	6368	-58.3	-	-		"	"	26.4
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

SWL
15.84
15.84
"
"
"
"

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Low flow pumped due to slow recharge

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW32				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW32
Job No:	BC200153.03	Date:	4/3/23
Recorded By:	DP	Time:	9:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
Minimum Purge Volume Required	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
								colar	odar	
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
09:30	8	6.47	6376	-57.5	0.36	4.3		M	II	26.5
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW32				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

1/3/23

Job Name:	Callide Qtly	Well No:	MW40
Job No:	BC200153.03	Date:	~~24/2/23~~
Recorded By:	DP	Time:	15:00
Weather:	Clear,		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	12.2
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.2

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	4.97	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	18.35	Depth (m BTOC): 15m
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		6.86	8132	30.1	0.34	4.6				29.4
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Dropped Hydrasleeve at 14:32 on 28/2/23

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☑ Other Hydrasleeve

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW40				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW43
Job No:	BC200153.03	Date:	3/3/23
Recorded By:	DP	Time:	13:00
Weather:	Clear, Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	24.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	30.4

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	7.77	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):	31.0	Depth (m BTOC):	27m
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
8.41	13:14	1	6.96	~~6851~~	-142	1.78	22.3		pink	H2S	25.2
8.41		~~2~~	~~7.04~~	~~101~~							
8.42	13:16	~~3~~ 2	6.83	7118	-96.2	1.12	13.5		pink	H2S	25.3
8.42	13:18	~~4~~ 3	6.72	7035	-99.7	0.93	11.5		pink	none	24.9
8.42	13:20	4	6.73	6947	-103.7	1.54	18.1		pink	none	25.4
	13:22	5	6.72	6995	-102.5	0.83	11.1		cloudy	none	25.4
	13:24	6	6.72	7010	-99.3	1.18	13.9		cloudy	none	25.4
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Low flow pumped due to slow recharge

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW43				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calide Qtly	Well No:	MW49
Job No:	BE20053.03	Date:	3/3/23
Recorded By:	DP	Time:	11:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	12.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	9.98	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	19.98	Depth (m BTOC): 15.0m
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		6.78	16035	-28.0	1.76	22.1				25.4
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeves dropped at 14:30 at ~~27/2/23~~ 1/3/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW49				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW56
Job No:	BC200153.03	Date:	3/3/23
Recorded By:	DP	Time:	12:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: ~~Plant~~ Dry, confirmed with Bear

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples					
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	BC200153.03	Well No:	MW66.
Job No:	Calide Qty	Date:	6/3/23.
Recorded By:	DP	Time:	14:45.
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	6.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	12.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	4.5.	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	13.35.	Depth (m BTOC): ~10m	
Height of Standing Water Column (TD-WL, in m):	8.85	Purged dry? ☐ No ☐ Yes, at _____ L	

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		92
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
14:33	0	7.13	176.1	-62.3	0.05	0.6		cloudy	H2S	24.0
14:39	20	7.04	210.3	-57.1	—	—	cloudy	~~cloudy~~	H2S	24.0
14:44	40	7.03	218.6	-40.8	—	—		cloudy	H2S	24.0
14:49	60	7.03	213	-28.3	—	—		cloudy	~~none~~ none	24.0
14:54	80	7.03	211	-21.7	—	—		11	none	24.0
14:56	90	7.03	214	-19.8	—	—		11	none	24.0
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Same as purge method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW66				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW68
Job No:	BC200153.03	Date:	3/3/23
Recorded By:	DP	Time:	12:15
Weather:	Cloudy - hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	9.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	9.42	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	17.19	Depth (m BTOC):	15m
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5	2.7	8.1
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
SWL										
7.44 12:24	0	6.91	8503	40.9	0.28	3.2		clear/bbs	orange cloudy	23.8
7.44	20	6.8	8517	39.4	0.03	0.3		"	clear	23.7
"	40	6.78	8520	38.4	—	—		"	"	23.8
"	60	6.77	8522	37.1	—	—		"	"	"
" 12:40	~~80~~ 70	6.77	8524	36.4	—	—		"	"	"
) 12:42	80	6.77	8521	36.0	—	—		"	"	"
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW68				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	BC 200153-03	Well No:	MW69.
Job No:	Callide Qtly	Date:	7/3/23
Recorded By:	DP	Time:	10:20
Weather:	Hot, Clear		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	8.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	17.5

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	12.20.
DNAPL Level Depth (DL in m BTOC):	
Total Depth of Well (TD in m BTOC):	15.57.
Height of Standing Water Column (TD-WL, in m):	3.37

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC): ~14m

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		33
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
12.61 10:28	10	6.90	220	57.3	1.37	16.7		cloudy	none	25.5
12.61 10:34	20	6.79	~~821~~ 295	54.1	0.94	11.2		clear	none	25.2
10:39	30	6.75	207.4	53.5	0.76	8.5		〃	〃	25.3
10:41	35	6.74	1000	52.7	0.73	8.3		〃	〃	25.3
10:43	40	6.74	1025	52.3	0.71	8.1		〃	〃	25.3
10:45	~~45~~	6.73	1027	51.7	0.54	6.3		〃	〃	〃
10:47	50	6.73	1030	51.4	0.49	6.1		〃	〃	〃
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW69				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	~~Bca~~ Callide Qtly	Well No:	MW70
Job No:	BC200153.03	Date:	7/3/23
Recorded By:	BP	Time:	9:10
Weather:	~~Cloudy~~ Hot, Clear		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	9.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.5

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	9.50.
DNAPL Level Depth (DL in m BTOC):	
Total Depth of Well (TD in m BTOC):	16.49
Height of Standing Water Column (TD-WL, in m):	

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC): ~14m

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		73
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
9:19	0	6.94	209	8.5	1.46	15.9		grey	mild H2S	24.1
9:23	20	6.77	189	23.5	0.10	1.2		cloudy	none	24.1
9:27	40	6.72	194	33.2	0.02	0.2		clear	none	24.1
9:31	60	6.69	197	38.3	—	—		clear	none	24.1
9:35	80	6.67	197	38.7	—	—		clear	none	24.1
~~9:39~~	90	6.66	193	39.2	—	—		"	"	"
~~9:43~~	100	6.66	192	39.4	—	—		"	"	"
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW70	BD04_0703	SD04_0703		
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Gallide Qtly	Well No:	MW72
Job No:	BC200153.03	Date:	2/3/23
Recorded By:	DP	Time:	8:45
Weather:	Hot, Clear		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	8.5
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	17.5

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	12.95	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	17.52	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):	4.57	Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5	16	48
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity / Colour	TDS / odour	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
12.96	8:44	0	6.99	849	72.3	0.04	0.5		Clear	none	23.9
12.96		20	6.88	847	81.8	—	—		Clear	none	23.9
12.96	8:50	40	6.81	847	85.8	—	—		〃	〃	〃
	8:53	50	6.80	847	87.3	—	—		〃	〃	23.9
8:55	~~8:55~~	~~70~~ 60	6.79	847	88.6	—	—		〃	〃	23.9
	8:57	~~80~~ 70	6.79	846	90.1	—	—		〃	〃	23.9
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Same as purge method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW72	BD02_0203	SD02_0203		
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW73
Job No:	BC200153.03	Date:	~~23/2/23~~ 2/3/22
Recorded By:	DP	Time:	8:00
Weather:	Hot, Sunny		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	~~10.0~~ 10.0
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	19.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	12.06	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	17.80	Depth (m BTOC):	15m
Height of Standing Water Column (TD-WL, in m):	5.74	Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5	~~20.0~~	60
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity / Colour	TDS / odor	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
SWL 12.08	0	6.73	2134	-38.3	0.94	10.3		cloudy	H_2S	24.4
12.08	20	6.47	2137	-11.1	0.14	1.7		cloudy	none	24.4
7:55	40	6.4	2137	4.8	0.2	0.02		"	"	24.4
8:00	60	6.39	2136	14.2	0	0		"	"	24.4
8:05	80	6.38	2135	22.2	—	—		"	"	24.4
8:09	100	6.37	2136	26.3	0	0		"	"	24.4
8:13	120	6.37	2136	28.2	—	—		"	"	24.4
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW73				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW74
Job No:	BE200153.03	Date:	2/3/23
Recorded By:	DP	Time:	11:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	17.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	26.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	10.37	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	28.02	Depth (m BTOC): 21.0m
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		7.10	3805	-13.5	1.56	19.6				28.3
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve dropped 2/3/23 at 11:00

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW74				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW75
Job No:	BL2001 53.03	Date:	3/3/23
Recorded By:	DP	Time:	8:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	3.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	20.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	4.48	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	22.40	Depth (m BTOC): ~14m
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		6.74	29301	53.3	1.62	21.2				24.5
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve dropped 12:00 on ~~2/3/23~~ 1/3/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☑ Other Hydrasleeve

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW75				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW76
Job No:	BE200153.03	Date:	3/3/23
Recorded By:	DP	Time:	8:30
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	20.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	26.5

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	~~19.14~~ 18.14	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	25.65	Depth (m BTOC): ~23m
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		7.83	8532	32.0	1.29	15.6				25.3
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve dropped at 13:30 at ~~2/3/23~~ 1/3/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☒ Other Hydrasleeve

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW76				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Oily	Well No:	MW7 ~~6~~
Job No:	BC200153.03	Date:	29/2/23
Recorded By:	DP	Time:	12:30
Weather: Hot			

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	~~20.5~~ 8.4
Well Head Condition:		Screen Interval – Bottom (m BTOC)	~~26.5~~ 11.4

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	6.82
DNAPL Level Depth (DL in m BTOC):	
Total Depth of Well (TD in m BTOC):	11.99
Height of Standing Water Column (TD-WL, in m):	5.17

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC): 10.5m

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5	18.09	~~54~~
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Water depth	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity (odor)	TDS (odor)	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU		~~None~~ H2S	°C
6.92	~~12:38~~	0	6.81	12700	-54.0	0.28	3.4		Brown	~~None~~ H2S	24.1
6.94	12:44	20	26.75	12779	-28.4	0.09	1.1		clear	H2S	25.5
6.96	12:52	30	6.75	12825	-7.9	0.02	0.2		clear	mild H2S	24.7
6.96	13:00	40	6.74	12790	-7.7	0.01	0.11		clear	None	24.0
6.97	13:08	50	6.74	12788	-5.2	0.15	1.7		clear	none	23.9
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW7				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW78
Job No:	BC200153.03	Date:	3·3·23
Recorded By:	DP	Time:	9:30
Weather:	humid & hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	14.2
Well Head Condition:		Screen Interval – Bottom (m BTOC)	25.2

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	9.05
DNAPL Level Depth (DL in m BTOC):	
Total Depth of Well (TD in m BTOC):	27
Height of Standing Water Column (TD-WL, in m):	17.95

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC): ~20m

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5	116 L	350 L
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
9.10	9:26	20	7.14	10355	44.3	0.09	1.2		clear	none	24.4
9.10	9:31	~~40~~ 60	7.08	10371	41.6	—	—		clear	none	24.5
"		~~60~~ 100	7.08	10376	40.2	—	—		clear	none	24.5
"	9:38	~~80~~ 140	7.07	10378	39.2	—	—		clear	none	24.5
"	9:45	~~100~~ 180	7.07	10379	38.6	—	—		"	"	"
"		~~120~~ 220	7.07	10380	38.0	—	—		"	"	"
"	9:52	~~140~~ 260	7.07	10385	37.6	—	—		"	"	"
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW78	BD03_0303	SD03_0303		
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Call:de Qtly	Well No:	~~MW78~~ MW78
Job No:	BE20153.03	Date:	3/3/23
Recorded By:	DP	Time:	10:00
Weather:	Cloudy		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
Minimum Purge Volume Required	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
9:59	300	7.07	10358	36.8	↓	→		clear	none	24.5
	340	7.07	10357	36.2	↓	→		"	"	"
	360	7.07	10352	35.9	↓	→		"	"	"
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW78	~~BDoL_0303~~	~~SDoL_0303~~		
Analysis/ Bottles		BD03_0303	SD03_0303		

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	BE200153.03	Well No:	MW79
Job No:	Callide Qtly	Date:	~~28/2/23~~ 2/3/23
Recorded By:	DP	Time:	9:30
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	11 m
Well Head Condition:		Screen Interval – Bottom (m BTOC)	19m

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	1.90	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC): ~15m
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	—	6.63	8151	36.3	0.44	5.5	-	—	—	25.3
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Hydrasleeve dropped 28/2/23 at 13:00

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☑ Other Hydrasleeve

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW79				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calide Qty	Well No:	MW80
Job No:	BC200153.03	Date:	2/3/23
Recorded By:	DP	Time:	9:30
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	4.5m
Well Head Condition:		Screen Interval – Bottom (m BTOC)	7.5m

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	1.65	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	~6.0m
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		10.18	970	36.1	0.26	3.3				28.9
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Hydrasleeve dropped 28/2/23 at 13:00

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☑ Other Hydrasleeve

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW80				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	ESC3
Job No:	BCZ00153.03	Date:	2/3/23.
Recorded By:	DP	Time:	2pm.
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	17.4
Well Head Condition:		Screen Interval – Bottom (m BTOC)	20.4

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	5.94	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	23.9	Depth (m BTOC):	19m.
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	17.96	3.5		188
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS odour	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
5.98	~~8~~	0	7.20	8627	-89.0	0.2	2.8		clear	mild H_2S	24.2
5.99	14:03	20	7.06	8660	-49.4	0.06	0.6		clear	none	23.7
5.99	14:06.	40	7.04	8657	-30.5	—	—		clear	none	23.8.
5.99	14:09	60	7.01	8660	-27.9	—	—		"	"	23.8
	14:12	80	7.00	8655	-22.2	—	—		"	"	23.7
	14:15	100	7.00	8659	-17.8	—	—		"	"	23.8
	14:18	120	7.00	8658	-14.2	—	—		"	"	23.8
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Same as purge method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	ESC3				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Collide Ally	Well No:	ESC3
Job No:	BC200153.03	Date:	2/3/23
Recorded By:	DP	Time:	14:00
Weather:	Cloudy		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	17.4
Well Head Condition:		Screen Interval – Bottom (m BTOC)	20.4

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
14:21	140	7.00	8644	-12.5	—	—	—	〃	〃	23.7
14:24	160	7.00	8630	-10.7	—	—		〃	〃	23.7
14:27	180	7.00	8627	-10.0	—	—		〃	〃	23.7
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	ESC3				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	ESC4
Job No:	BC200153.03	Date:	~~29/2/23~~ 3/3/23
Recorded By:	DP	Time:	
Weather:	V. Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	9.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.5

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	6.49	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	23.93	Depth (m BTOC): ~16 m
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		6.97	8220	65.1	0.35	4.5				26.2
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve dropped at 14:00 on ~~29/2/23~~ 1/3/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☑ Other Hydrasleeve

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	ESC4				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	~~L006~~ L005-B01
Job No:	BC200153.03	Date:	7/3/23
Recorded By:	DP	Time:	9:00
Weather:	Clear, Hot		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
	10 min	7.35	2067	61.3	5.53	67.6		clear	none	26.6
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	L005-B01				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	L006-B05
Job No:	BC200153.03	Date:	4/3/23
Recorded By:	DP	Time:	11:00
Weather:	Hot, Clear		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☑ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity odour	TDS colour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
	10 mins	6.66	1777	33.2	2.98	38.4		none	clear	28.9
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Left to run for 10 mins before sampling

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	L006-B05				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	LO12-B01
Job No:	BC200153.03	Date:	8/3/23
Recorded By:	DP	Time:	8:00
Weather:	Clear		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
	10 min	6.55	1278	86.5	0.95	11.8		clear	none	26.3
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	LO12-B01	BD05_0803	SD05_0803		
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calide Qtly	Well No:	L021-B01
Job No:	BC200153.03	Date:	6/3/23
Recorded By:	DP	Time:	8:30
Weather:	Clear		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
	10 min	6.91	560	65.1	2.26	28.2		clear	none	27.0
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	L021-B01				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	RN13030112
Job No:	Bc200153.03	Date:	~~4/5/23~~ ~~4/5/23~~
Recorded By:	DP	Time:	12~~30~~ 4/3/23
Weather:	Hot, Clear		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	N/A
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	8.35	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	14.5	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		couldn't get hydrasleeve past ~10m, even with extra weights attached								
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: ~~Hydrasleeve dropped at ~~ ~~m at~~ ~~4/5/23~~

WELL SAMPLING

SAMPLING METHOD
☐ Same as purge method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples					
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	RN130301 26
Job No:	BC200153.03	Date:	6/3/23
Recorded By:	DP	Time:	10:00
Weather:	Hot, Clear		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	N/A
Well Head Condition:		Screen Interval – Bottom (m BTOC)	N/A

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	10.49	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	19.36	Depth (m BTOC): 18 m
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		93
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS Odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
10:36	20	6.76	519	32.6	—	—		grey	none	25.1
10:42	40	6.73	518	66.1	—	—		clear	none	24.9
10:48	60	6.71	516	72.1	—	—		clear	none	24.9
10:54	80	6.70	516	76.2	—	—		clear	none	24.8
10:57	~~100~~ 90	6.69	520.	72.3	—	—		"	"	24.8.
11:00	~~110~~ 100	6.69	521	72.5	—	—		"	"	24.8
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD ☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	RN130301 26				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	RN13030127
Job No:	BC200153.03	Date:	~~6/3/23~~ 7/8/23
Recorded By:	DP	Time:	~~9:45~~ 13:45
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	15.3
Well Head Condition:		Screen Interval – Bottom (m BTOC)	17.4

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	6.38	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	15.37	Depth (m BTOC): ~15m
Height of Standing Water Column (TD-WL, in m):	~~15.37~~	Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
9:45 (before purge 6/3/23)		6.86	897	-64.3	0.59	7.7		brown	none	29.3
13:53 (after purge 7/8/23)		6.94	727	-67.6	0.53	6.8		cloudy	none	27.3
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Purged dry at ~5L at 9:45 6/3/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN13030127				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calide Dtly	Well No:	RN13030692
Job No:	BC200153.03	Date:	~~29/8/23~~ 1/3/23
Recorded By:	DP	Time:	8:00
Weather:	Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	~~12.7~~ 15.7
Well Head Condition:	Good	Screen Interval – Bottom (m BTOC)	~~16.7~~ 16.7

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	9.96	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	17.31	Depth (m BTOC):	~16.5
Height of Standing Water Column (TD-WL, in m):	7.35	Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5	~~22.05~~	~~66.15~~ ~~77~~ 77
	50	150		6.5		
					25.7	

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
depth (m) 9.96										
8:04	0	6.97	484.1	81.1	1.86	23.6		clear	none	25.3
8:08	20	6.79	481.5	83.7	1.65	20.1		clear	none	25
8:13	40	6.73	480.3	85.3	1.62	19.7		"	"	24.9
8:19	60	6.73	479.5	87.3	1.62	23		"	"	24.8
8:23	80	6.72	479.3	88.5	1.73	20.8		"	"	24.8
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN13030698				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	RN13030697
Job No:	BC200153.03	Date:	6/3/23
Recorded By:	DP	Time:	~~11:30~~ 9:00
Weather:	Hot, Clear		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	12.7
Well Head Condition:		Screen Interval – Bottom (m BTOC)	13.7

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	9.12 / 10.61
DNAPL Level Depth (DL in m BTOC):	
Total Depth of Well (TD in m BTOC):	12.26
Height of Standing Water Column (TD-WL, in m):	

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC): ~~[illegible]~~ ~ 12m

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

during purge ↓

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
11:49		7.22	1140	45.5	3.07	38		v cloudy	odourless	
9:00		7.07	1152	-75.5	—	—		grey	odourless	27.3
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

↑ after purging

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Purged dry at ~5L on 4/3/23, sampled 6/3/23

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN13030697				
Analysis/ Bottles	couldn't fill all bottles before well went dry again				

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calliope 2Hy	Well No:	RN13030698
Job No:	BC200153.03	Date:	~~29/2/23~~ 1/3/23
Recorded By:	DP	Time:	
Weather:	Sunny, Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	17.2
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.2

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	8.10	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	19.14	Depth (m BTOC): ~18 m
Height of Standing Water Column (TD-WL, in m):	11.04	Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5	38.64	115.92
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

depth

8.11

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
9:18	20	6.67	2138	62	0.95	11.5	/	clear	colourless	24
9:22	40	6.65	2142	59.2	0.73	8.5	/	"	"	24
9:27	60	6.64	~~2142~~ 2142	58.2	0.68	8.6	/	"	"	24
9:31	80	6.64	~~2142~~ 2142	56.9	0.56	6.7	/	"	"	24
9:35	100	6.64	2142	56.3	0.55	6.8	/	"	"	24
9:40	120	6.64	2142	56.4	0.57	6.8	/	"	"	24
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN13030698	BD01_2702	SD01_2702		
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	RN130307 15
Job No:	BC200153.03	Date:	7/3/23
Recorded By:	DP	Time:	11:30
Weather:	Clear, Hot		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	11.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	9.40	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	14.63	Depth (m BTOC): ~~13m~~	
Height of Standing Water Column (TD-WL, in m):	5.23	Purged dry? ☐ No ☐ Yes, at _____ L	

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		54
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
9.80	11:44	0	7.18	503	61.7	4.90	60.1		brown	none	24.7
9.80	11:49	20	7.13	227	61.3	5.72	68.3		clear	none	24.5
	11:56	40	7.10	228	63.2	5.48	65.8		〃	〃	〃
		50	7.10	22.5	63.0	5.22	62.5		〃	〃	〃
		60	7.10	224	62.8	5.13	60.3		〃	〃	〃
		70									
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	RN130307 15			RB01_0903	
Analysis/ Bottles					

Taken from ~~Bore~~ pump

SURFACE WATER FIELD MONITORING SHEET

Job Name:	Calide Q4y		Recorded By:	DP
Job number:	BC200153.03		Date:	27/2/23

Sampling Data

Sample ID	QAQC ID	Field Parameters (Specify Units)							
		NTU	pH	EC	°C	Redox	TDS	DO %	ppm
PW1			8.16	9759	27.6	80.1		57.0	4.34
DRD			7.93	11480	27.5	80.8		520	3.93
SW43			7.50	423.8	26.9	67.3		58.1	4.63
SW36			8.65	377.1	29.3	58.9		67.7	5.20
SW2			8.25	2631	31.5	47.1		50.6	3.67
SW20			8.87	454	31.0	57.0		72.8	5.34
SW12			8.01	4347	36.5	56.6		78.4	5.10
Notch-V2			7.84	16385	29.3	100.8		121.0*	8.79
Notch-V1			7.26	17680	27.7	89.8		57.2	4.24
PW2			8.21	9719	28.7	~~85~~ 85.1		81.5	6.11
SW13			6.94	11512	27.7	78.0		49.6	3.77

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	
Borrow Pit A					Too shallow to sample
~~SW45 SW22~~					~~water too shallow to sample safely, very boggy at water's edge~~
SW40					Water too shallow, would need to wade through 50m of bog to get to sample point
SW32					dry
SW34					dry
SW37					too shallow to sample
~~SW44~~					dry
SW35					dry
SW28					dry
SW46					dry

SURFACE WATER FIELD MONITORING SHEET

Job Name:	Callide Qtly		**Recorded By:** DP
Job number:	BC200153.03		**Date:** 6/3/23

Sampling Data

Sample ID	QAQC ID	Field Parameters (Specify Units)							
		NTU	pH	EC	°C	Redox	TDS	DO % ppm mg/L	
SW41			7.60	672	34.2	63.1		29.7	2.09
7/3/23 SW22			7.74	215.4	30.4	43.4		35.7	2.68

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	

Weed hygiene declaration

Part 1: Sale or supply of things

(Examples of 'things' include fodder, grain, seed, livestock, gravel, sand, soil, mulch, packing material, machinery, vehicles or water)

This declaration is valid for supplying the thing/things specified below from _____ to _____ (please provide dates)

1. Thing (please tick the relevant box and provide a brief description)

☐ Fodder ☐ Grain/seeds ☐ Sand/gravel ☐ Machinery ☐ Mulch ☐ Livestock ☐ Other

Amount _____ (e.g. weight, size of load, number of items)

Description _____ (e.g. cattle, hay, dozer)

2. Has the thing been moved through, stored in, come from, or used in a place infested with:

	Yes	No	Maybe
Parthenium			
Giant rat's tail grass, American rat's tail grass, giant Parramatta grass, Parramatta grass			
Prickly acacia			
Other (provide details)			

3. If you answered 'yes' or 'maybe' in question 2, then what actions have been taken to remove or ensure that there is no weed reproductive material*? (please tick the relevant boxes and specify steps taken)

*Please refer to the definition of 'weed reproductive material' in the explanatory notes.

☐ Nil ☐ Washing/cleaning ☐ Quarantine period ☐ Chemical treatment ☐ Certified clean _____ Other

Steps taken _____

4. To the best of my knowledge the thing described above still contains a weed listed in question 2 above.

Yes	No	Maybe

I, _____ of _____

town _____ state _____ telephone _____

declare that the information that I have provided in this declaration is true and correct and I have read the accompanying explanatory notes before completing this declaration.

Signature _____ Date _____

Part 2: Transport of contaminated things

('Vehicle' includes anything used for carrying any thing or any person by land, water or air, and includes equipment or machinery capable of moving on land)

This declaration is valid for transport and movement of vehicles and other things from CSE to BRANDT (please provide locations)

1. Movement of vehicles—The vehicle described as: make TOYOTA HILUX

registration no. or engine/frame no. 958 FN 7 was clean* prior to entry to MATT BRANDT PTY (destination)

*Please refer to the definition of 'clean' in the explanatory notes.

2. Transport of contaminated things—If you are transporting anything contaminated or possibly contaminated with any declared weed, what actions are being used to contain the weed reproductive material?

☒ Nil ☐ Covered with tarpaulin ☐ Enclosed within container ☐ Chemically treated _____ Other

Actions: N/A

I,* DARE LAWRENCE of 118 Jubilee Tce

town Borden state QLD telephone 0448070568.

*If same as Part 1 please write 'as above'

declare that the information that I have provided in this declaration is true and correct and I have read the accompanying explanatory notes before completing this declaration.

Signature _____ Date 08-03-23

Explanatory notes

This declaration was developed in response to landholders, rural industry, community and government desire to minimise the impact of weeds on their business and on the environment. It has been developed to assist in preventing the spread of weeds and other contaminants, and to meet the requirements of section 45 of the *Land Protection (Pest and Stock Route Management) Act 2002*. A completed declaration provides information on the status of a 'thing', whether it is contaminated or free of weedy material. 'Part 1: Sale or supply of things' of the declaration should be completed by the supplier then given to the receiver before they receive the thing. The receiver can then make an informed decision and take precautions to prevent new infestations. It can also provide written assurance that a vehicle is clean before entering a property.

Why use this declaration?
This declaration can provide:

- a supplier with a way of meeting the requirements of section 45 (2) of the Act, if they are supplying any thing that is or could be contaminated with the weeds listed below
- a person obtaining a thing with information on whether the thing is clean of weed reproductive material or has been infested
- assurance that a vehicle was clean* prior to entry onto a property
- assurance that any contaminated or potentially contaminated thing is being moved so as not to spread the contaminant
- assurance that a product is free of other weedy reproductive material.

Section 45 of the Act makes it an offence to supply a thing that is contaminated with a Class 1 weed or any of the Class 2 weeds listed below. However, for the Class 2 weeds, a person does not breach section 45 if they provide a written notice (Part 1 of this declaration) that states that the thing is or may be contaminated. The written notice must be filled and given to the receiver before the thing is supplied.

List of Class 2 species
The following Class 2 pests are prescribed in section 45(1)(b) of the Act. These weeds are readily able to infest a wide range of products, from livestock to grain and vehicles. These weeds have a major effect on pasture production and have the capacity to invade large areas of Queensland.

Common name	Species
American rat's tail grass	*Sporobolus jacquemontii*
Giant Parramatta grass	*Sporobolus fertilis*
Giant rat's tail grass	*Sporobolus pyramidalis* and *S. natalensis*
Parramatta grass	*Sporobolus africanus*
Parthenium	*Parthenium hysterophorus*
Prickly acacia	*Acacia nilotica*

Across Queensland, isolated outbreaks of declared plants such as those listed above are found on properties and roadsides each year. Outbreaks of these declared plants are often located hundreds of kilometres from core infestations. These outbreaks occur as a result of machinery, livestock, vehicles, fodder, grain, material and equipment contaminated with weed seeds being transported across the state. A high percentage of seed from prickly acacia and giant rats tail grass remains viable after being eaten and excreted by cattle.

***Definitions**
Clean:

- For vehicles, machinery and equipment, clean means that no soil and/or organic matter that may contain weed reproductive material is on or in areas that are accessible during cleaning and maintenance work. A checklist and guidelines that show areas that are required to be clean are available at www.biosecurity.qld.gov.au
- A vehicle is considered to remain clean if it leaves its point of origin clean and only travels on sealed roads or well-maintained unsealed roads.
- For livestock, clean means that animals are internally and externally free of the reproductive material of any declared plant listed in the Land Protection (Pest and Stock Route Management) Regulation 2003. If livestock are suspected to be infested with a declared weed, then they should be quarantined within a weed-free paddock or pen for a 14-day period.

Weed reproductive material means any part of the plant that is capable of producing another plant by sexual or asexual reproduction. Examples include seeds, bulbs, rhizomes, tuber, stem or leaf cutting and the whole plant.

Well-maintained unsealed road means roads that do not have vegetation growing on or encroaching onto the area occupied by traffic.

For further information, please contact Biosecurity Queensland on 13 25 23.

Queensland Government

PR10_4996

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003842-9003846 - INTERFACE METER

Plant Number: 235279

Probe Length: 60mt

ITEM	TEST	PASS	COMMENTS
Battery	Compartment / Capacity	☑	9v
Probe	Clean / Operation	☑	
Earth Lead	Check if equipped	☑	
Tape Check	Cleaned / Checked for cuts	☑	
Function test	At surface level	☑	

Note: Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Scott Crawford Date: 03 /04/ 23 Signed: S.

Accessories List:

Interface Meter	Tape Guide	Decon 90 Solution
Brush	Spare 9v Battery	Instruction Manual
Transport Box		

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003871 WATER QUALITY METER – MULTIFUNCTION

Plant Number: 1072254

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	393181 397396	☑
Conductivity	2.76 mS/cm @ 25°C	2.76 mS/cm		396172	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.0% in Sodium Sulphite	% Saturation in Air	12110	☑
ORP	240mV @ 25°C	240mV	-	398884/395163	☑

Battery Status 80 %	Temperature 19.2 °C
	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Scott Crawford Date: 26/05/23 Signed: S.

Accessories List:

User's Manual & USB	pH Sensor	Conductivity Sensor
Dissolved Oxygen Sensor with Wetting Cap	Redox (ORP) Sensor with Wetting Cap	Flow Cell 500ml
Comm Cable	Testing Cap	Storage Cap

DAILY LOG

DATE:	**6/6/23**
TIME START:	**10:00**
TIME END:	**15:00**

Project No: BC200153.03

Project Manager: Luke Amies

Site: Callide Power Station

Recorded by: DP

Other field Staff:

Contractors

PRE START

Planned tasks for the Day:

Mobilise to site and begin surface water sampling

Equipment in use:

LV

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			
INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE					

DATE:	**6/6/23**
TIME START:	**10:00**
TIME END:	**15:00**

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

Arrive in Gladstone at 8:30
Arrived in Biloela at 10:00
Finished collecting equipment and commenced surface water sampling from 12:00 to 15:00
Left site at 15:00

DAILY LOG

DATE:	**7/6/23**
TIME START:	**7:00**
TIME END:	**16:00**

Project No: BC200153.03

Project Manager: Luke Amies

Site: Callide Power Station

Recorded by: DP

Other field Staff:

Contractors

PRE START

Planned tasks for the Day:

Perform surface water sampling and begin groundwater sampling

Equipment in use:

LV

IP

YSI

Monsoon Pump

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

DATE:	7/6/23
TIME START:	7:00
TIME END:	16:00

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

Arrived on site at 7:00
Performed surface water and groundwater sampling from 7:30 to 15:30
Left site at 15:45

DAILY LOG

DATE:	**8/6/23**
TIME START:	**7:00**
TIME END:	**16:00**

Project No: BC200153.03

Project Manager: Luke Amies

Site: Callide Power Station

Recorded by: DP

Other field Staff: Dare Lawrence, Sharon Geall

Contractors

PRE START

Planned tasks for the Day:

Perform groundwater sampling on wells using the monsoon pump

Equipment in use:

LV

IP

YSI

Monsoon Pump

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

DAILY LOG

DATE:	**8/6/23**
TIME START:	**7:00**
TIME END:	**16:00**

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

Arrived on site at 7:00
Performed groundwater sampling between 7:30 and 15:30
Left site at 15:45

DAILY LOG

DATE:	**9/6/23**
TIME START:	**7:00**
TIME END:	**16:00**

Project No: BC200153.03

Project Manager: Luke Amies

Site: Callide Power Station

Recorded by: DP

Other field Staff: Dare Lawrence, Sharon Geall

Contractors

PRE START

Planned tasks for the Day:

Perform groundwater sampling on wells using the monsoon pump

Equipment in use:

LV

IP

YSI

Monsoon Pump

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

DAILY LOG

DATE:	**9/6/23**
TIME START:	**7:00**
TIME END:	**16:00**

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

Arrived on site at 7:00
Performed groundwater sampling between 7:30 and 15:30
Left site at 15:45

DAILY LOG

DATE:	**10/6/23**
TIME START:	**8:00**
TIME END:	**14:00**

Project No: BC200153.03

Project Manager: Luke Amies

Site: Callide Power Station

Recorded by: DP

Other field Staff: Dare Lawrence

Contractors

PRE START

Planned tasks for the Day:

Perform groundwater sampling on wells using the monsoon pump

Equipment in use:

LV

IP

YSI

Monsoon Pump

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

DAILY LOG

DATE:	**10/6/23**
TIME START:	**8:00**
TIME END:	**14:00**

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

Arrived on site at 8:00
Performed groundwater sampling between 8:30 and 13:30
Left site at 13:45

DAILY LOG

DATE:	**12/6/23**
TIME START:	**7:00**
TIME END:	**16:30**

Project No: BC200153.03

Project Manager: Luke Amies

Site: Callide Power Station

Recorded by: DP

Other field Staff: Dare Lawrence, Sharon Geall

Contractors

PRE START

Planned tasks for the Day:

Perform groundwater sampling on wells using the monsoon pump

Clean off car to gain access to Matt Brandt's property tomorrow

Equipment in use:

LV

IP

YSI

Monsoon Pump

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

DAILY LOG

DATE:	**12/6/23**
TIME START:	**7:00**
TIME END:	**16:30**

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

Arrived on site at 7:30
Performed groundwater sampling between 7:30 and 14:30
Cleaned off car for weed and seed checkoff at 15:00
Left site at 16:30

DAILY LOG

DATE:	**13/6/23**
TIME START:	**7:00**
TIME END:	**16:30**

Project No: BC200153.03

Project Manager: Luke Amies

Site: Callide Power Station

Recorded by: DP

Other field Staff: Dare Lawrence, Sharon Geall

Contractors

PRE START

Planned tasks for the Day:

Perform groundwater sampling on wells using the monsoon pump

Drop hydrasleeves into additional sampling locations.

Sample MW97

Equipment in use:

LV

IP

YSI

Monsoon Pump

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

DATE:	**13/6/23**
TIME START:	**7:00**
TIME END:	**16:30**

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

Arrived on site at 7:30
Car checked off for Weed and Seed by Dare Lawrence, subsequently samples wells at Matt Brandt's property
Performed surface water and groundwater sampling between 8:00 and 16:00
Hydrasleeves dropped into additional wells (MW06, MW26, MW27, MW59, MW60, Bore X)
Purged MW97 dry to sample tomorrow, couldn't get water level to stabilise on low flow pumping
Left site at 16:30

DAILY LOG

DATE:	**14/6/23**
TIME START:	**7:30**
TIME END:	**13:30**

Project No: BC200153.03

Project Manager: Luke Amies

Site: Callide Power Station

Recorded by: DP

Other field Staff: Dare Lawrence, Sharon Geall

Contractors

PRE START

Planned tasks for the Day:

Collect hydrasleeves from additional sampling locations

Sample MW97 following purging

Check ESC5 and ESC6 with borehole camera

Equipment in use:

LV

IP

YSI

Borehole Camera

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

DATE:	14/6/23
TIME START:	7:30
TIME END:	13:30

NOTES FOR THE DAY

Arrived on site at 7:30
Collected hydrasleeves from additional well locations
Sampled MW97
Checked ESC5 and ESC6 with the borehole camera, MW61 could not be accessed-couldn't fit camera inside bore without removing the pump (would require a forklift). No evidence of damage to the casing was observed inside the bores
Left site at 13:30

DAILY LOG

DATE:	**15/6/23**
TIME START:	**8:00**
TIME END:	**13:00**

Project No: BC200153.03

Project Manager: Luke Amies

Site: Callide Power Station

Recorded by: DP

Other field Staff:

Contractors

PRE START

Planned tasks for the Day:

Demobilise from site, finish COC and send all samples to site

Equipment in use:

LV

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

DATE:	15/6/23
TIME START:	8:00
TIME END:	13:00

Arrived on site at 8:00
Dropped off all equipment and sorted out samples/COC
Left site at 13:00
Arrived in Gladstone at 16:00
Arrived in Brisbane at 20:00

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	~~MW06~~ MW06
Job No:	BG200153.03	Date:	13/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	4.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	7.5

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	2.3.	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		6.70	18843	61.4	1.81	22.3				23.4
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve ✍ collected 14/6/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW06				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW09
Job No:	BC200153.03	Date:	8/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	7.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	10.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	7.20	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
10:08	0	6.87	11153	68.5	1.88	22.8	—	brown	none	25.0
10:11	1	6.82	11001	67.3	0.97	12.1	—	cloudy	none	24.5
10:14	2	6.81	10953	65.0	0.84	10.5	—	clear	none	24.5
10:17	3	6.81	10935	62.8	0.75	9.2	—	"	"	24.5
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

7.34

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW09				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW11
Job No:	BC200153.03	Date:	8/6/23
Recorded By:	DP	Time:	
Weather:	Clear		

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	5.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	8.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		Bailer Type: PVC SS Teflon Other
Water Level Depth (WL in m BTOC):	4.72	Pump Type: Submersible Bladder Peristaltic Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	8	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):	3.28	Purged dry? No Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		35
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colar	TDS odor	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
12:16	0	7.01	8637	-163.3	0.43	5.1	—	Clear	H2S	23.2
12:18	10	7.00	8644	-157.4	0.27	3.2	—	Clear	H2S	23.2
12:20	20	7.01	8652	-145.0	0.14	1.5	—	"	"	"
	30	6.95	8658	-135.0	0.02	0.3	—	"	none	"
	40	6.95	8678	-124.2	0.02	0.3	—	"	"	"
	50	6.95	8681	-117.4	—	—	—	"	"	"
	60	6.95	86	-110.3	—	—	—	"	"	"
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: Drums Other:

WELL SAMPLING

SAMPLING METHOD
Bailer – Type: PVC SS Teflon Other
Same as purge method
Pump – Type: Submersible Bladder Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW11				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW11
Job No:	BC200153.03	Date:	8/6/23
Recorded By:	DF	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	70	6.95	8685	-105.8	—	—	—	〃	〃	〃
	80	6.95	8688	-102.3	—	—	—	〃	〃	〃
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW11				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW26
Job No:	BC200153.03	Date:	13/6/23
Recorded By:	DP	Time:	10:10
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	12.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	15.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	3.92	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	15.0	Depth (m BTOC): 13.0
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		7.04	8785	50.6	1.68	20.2				23.2
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve collected 14/6/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW26				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW27
Job No:	BC200153.03	Date:	13/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	19.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	22.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	7.24	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		6.84	20748	44.8	2.41	31.3				25.1
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW27				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW31
Job No:	BC200153.03	Date:	9/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	11.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	14.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		Bailer Type: PVC SS Teflon Other
Water Level Depth (WL in m BTOC):	6.35	Pump Type: Submersible Bladder Peristaltic Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	13.20	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? No Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
SWL	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		0							clear		
7.11	11:14	1	7.02	3018	-150.0	0.64	7.6	—	~~cloudy~~	H2S	24.2
7.12	11:16	2	7.02	3074	-148.9	0.47	5.6	—	clear	none	24.4
7.13	11:18	3	7.04	3084	-150.5	0.41	4.8	—	"	"	"
7.14	11:20	4	7.05	3092	-151.4	0.38	4.5	—	"	"	"
7.14	11:22	5	7.05	3098	-152.2	0.36	4.2	—	"	"	"
		6									
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: Drums Other:

WELL SAMPLING

SAMPLING METHOD
Bailer – Type: PVC SS Teflon Other
Same as purge method
Pump – Type: Submersible Bladder Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	~~Comments~~
	MW31			FB01_0906	
Analysis/ Bottles				From Pump	

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW32
Job No:	BC200153.03	Date:	10/6/23
Recorded By:		Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	22.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	25.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	16.38	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	25.0	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
SWL										
8.56										
9:18	0	6.59	6524	-137.1	2.12	26.2	—	clear	H_2S	25.8
9:20	1	6.53	6174	-121.8	1.57	20.2	—	clear	~~none~~ H_2S	25.2
9:22	2	6.53	6181	-123.4	1.69	19.3	—	"	H_2S	25.4
9:24	3	6.54	6472	-127.0	1.26	15.7	—	"	"	25.6
9:26	4	6.54	6480	-122.6	1.48	17.7	—	"	"	25.5
9:28	5	6.54	6488	-120.7	1.38	17.2	—	"	"	25.5 ✓
	6									
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW32				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW40.
Job No:	BC200153.03	Date:	8/6/23.
Recorded By:	DP	Time:	
Weather:	clear.		

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		Bailer Type: PVC SS Teflon Other
Water Level Depth (WL in m BTOC):	5.50.	Pump Type: Submersible Bladder Peristaltic Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	18.42.	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? No Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		6.83	7950	-11.9	0.91	10.9		clear	none	24.5
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: Drums Other: Hydrasleeve collected 12/6/23

WELL SAMPLING

SAMPLING METHOD
Bailer – Type: PVC SS Teflon Other
Same as purge method
Pump – Type: Submersible Bladder Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW40				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET MW42

Job Name:		Well No:	~~MW42~~
Job No:	BL200153.03	Date:	12/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	19.2
Well Head Condition:		Screen Interval – Bottom (m BTOC)	25.2

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	9.40	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	25	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):	~~0.6~~	Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		160
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		0	7.02	9373	-27.3	1.61	20.0		pink	H_2S	24.5
9.52		20	6.95	9467	-6.8	0.32	4.0		clear	none	24.5
9.52		40	6.94	9503	-1.3	0.16	1.7		clear	none	24.5
9.53	14:21	80	6.93	9524	3.1	0.06	0.7		clear	none	24.6
	14:29	120	6.93	9535	4.0	—	—		〃	〃	24.6
		140	6.93	9540	4.7	—	—		〃	〃	24.6
		160	6.93	9542	5.1	—	—		〃	〃	24.5
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW42			RB01_1206	
Analysis/ Bottles				From dipper	

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW43
Job No:	BC200153.03	Date:	9/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	24.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	30.4

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	8.1	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS ~~H2S~~ odour	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
8.32	10:40	0	7.16	4777	-204.6	2.03	24.9	—	pink	H_2S	25.5
8.36	10:42	1	6.84	6808	-174.2	2.56	31.4	—	pink	H_2S	25.0
8.36	10:44	2	6.81	7116	-155.7	2.61	33.2	—	cloudy	H_2S	25.4
8.36		3	6.75	7124	-149.5	2.56	31.6	—	cloudy	H_2S	25.1
		4	6.74	7104	-145.3	2.24	27.8	—	"	"	25.0
		5	6.75	7108	-142.1	2.58	31.7	—	"	"	25.0
		6									
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW43				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW49.
Job No:	BC200153-03	Date:	8/6/23.
Recorded By:	DP	Time:	
Weather:	clear		

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		Bailer Type: PVC SS Teflon Other
Water Level Depth (WL in m BTOC):	9.36.	Pump Type: Submersible Bladder Peristaltic Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? No Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
								colour	odour	
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		6.75	1449	-47.2	2.97	22.3		clear	none	24.5
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: Drums Other:

WELL SAMPLING

SAMPLING METHOD
Bailer – Type: PVC SS Teflon Other
Same as purge method
Pump – Type: Submersible Bladder Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW49				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW59
Job No:	BC220153.03	Date:	13/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	—
Well Head Condition:		Screen Interval – Bottom (m BTOC)	—

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	5.57	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	15.0	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity ~~Colour~~	TDS ~~odour~~	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		7.45	10471	362	2.97	36.5	—			24.2
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Hydrasleeve collected 14/6/23

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW59				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	~~MW60~~ MW60
Job No:	BC200153.03	Date:	13/6/23
Recorded By:	DP	Time:	10:35
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS _ Other:	Screen Interval – Top (m BTOC)	—
Well Head Condition:		Screen Interval – Bottom (m BTOC)	—

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	4.82	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	50.0	Depth (m BTOC): 40.0
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		6.65	23308	54.9	1.32	17.2				24.8
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve collected 14/6/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW60				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW68
Job No:	BC200153.03	Date:	7/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		Bailer Type: PVC SS Teflon Other
Water Level Depth (WL in m BTOC):	9.9	Pump Type: Submersible Bladder Peristaltic Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	17.29	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? No Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		78
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
14:21	0	6.70	8500	60.2	0.45	5.7	—	brown	none	26.0
14:25	20	6.70	8329	56.4	0.48	5.8	—	Clear	none	23.8
14:29	40	6.71	8305	49.4	0.23	2.9	—	11	11	23.7
14:33	60	6.71	8307	49.1	0.30	3.7	—	11	11	23.7
14:36	80	6.72	8284	48.3	0.33	4.0	—	11	11	23.6
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: Drums Other:

WELL SAMPLING

SAMPLING METHOD
Bailer – Type: PVC SS Teflon Other
Same as purge method
Pump – Type: Submersible Bladder Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW68			RB01_0706	
Analysis/ Bottles				From pump	

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW69
Job No:	BC200153.03	Date:	13/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	8.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	17.5

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	12.3	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	17.5	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):	5.2	Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		55
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
SWL	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
12.41	10	6.70	1058	-40.0	0.84	10.0	—	cloudy	none	24.1
"	20	6.66	1062	-11.2	0.14	1.7	—	clear	none	24.1
"	30	6.65	1061	-2.0	0.11	1.1	—	"	"	24.1
"	40	6.65	1061	3.0	0.07	0.8	—	"	"	24.1
"	50	6.66	1060	~~0.0~~ 14.6	0.02	0.3	—	"	"	24.1
	60	6.66	1062	17.7	—	—	—	"	"	24.2
	70	6.66	1063	20.8	—	—	—	"	"	24.3
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW69			RB01_1306	
Analysis/ Bottles				From dipper	

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW70
Job No:	BC200153.03	Date:	13/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	9.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	7.0	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	~18.5	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		12.0
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
	20	6.78	724	11.4	0.41	4.8	—	clear	none	23.7
	~~40~~									
	60	6.67	725	28.7	0.18	1.7	—	clear	none	23.8
	80	6.63	726	34.3	0.08	0.9	—	"	"	23.8
	100	6.63	726	37.5	0.04	0.4	—	"	"	23.8
	120	6.62	726	37.5	—	—	—	"	"	"
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW70				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	~~AAWT3~~ MW72
Job No:	BC200153.03	Date:	7/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		Bailer Type: PVC SS Teflon Other
Water Level Depth (WL in m BTOC):	14	Pump Type: Submersible Bladder Peristaltic Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	17.5	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? No Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		36.5
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
13:44	0	6.59	933	31.9	0.65	8.2	—	clear	none	27.1
13:48	20	6.48	874	30.1	0.52	6.3	—	"	"	25.9
13:52	~~13:50~~ ~~30~~ 40	6.40	856	35.0	0.38	4.3	—	"	"	24.5
13:54	50	6.39	849	33.9	0.36	4.2	—	"	"	24.1
13:56	60	6.39	846	34.8	0.42	4.8	—	"	"	24.2 ✓
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: Drums Other:

WELL SAMPLING

SAMPLING METHOD
Bailer – Type: PVC SS Teflon Other
Same as purge method
Pump – Type: Submersible Bladder Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW72				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	~~MW72~~ MW73
Job No:	BC220153.03	Date:	7/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	12.46	☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	17.54	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):	5.08	Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100	5.08	3.5		53
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

SWL	Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity (odor)	TDS (odor)	Temp.
	HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
12.50	13:00	0	6.37	2391	-22.0	1.27	15.0	—	cloudy	ltzs	26.4
	13:04	20	6.14	2276	-9.0	0.42	5.1	—	clear	none	25.1
	13:08	40	6.14	2281	8.3	0.38	4.5	—	"	"	25.6
	13:10	50	6.13	2303	10.4	0.46	5.7	—	"	"	25.7
	13:12	60	6.13	2310	15.5	0.42	5.3	—	"	"	25.9
Acceptable Variation			± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N											

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☑ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW73				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW74
Job No:	BC200153.03	Date:	8/6/23
Recorded By:	DP	Time:	
Weather:	clear		

CONSTRUCTION INFORMATION

Well Type:	Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	10.91	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC): 21 m	
Height of Standing Water Column (TD-WL, in m):	27.75	Purged dry? ☐ No ☐ Yes, at _____ L	

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity (colour)	TDS (odour)	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		6.99	3282	-54.1	1.21	13.6		clear	none	20.7
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: ~~Sump~~ Hydrasleeve sampled 12/6/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW74				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW75
Job No:	BC200153.03	Date:	12/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	3
Well Head Condition:		Screen Interval – Bottom (m BTOC)	20.5

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		Bailer Type: PVC SS Teflon Other
Water Level Depth (WL in m BTOC):	4.83	Pump Type: Submersible Bladder Peristaltic Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? No Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
								odour	odour	
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		6.72	18595	48.5	1.41	17.8	—	clear	none	25.8
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: Drums Other:

WELL SAMPLING

SAMPLING METHOD
Bailer – Type: PVC SS Teflon Other
Same as purge method
Pump – Type: Submersible Bladder Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW75				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW76
Job No:	BE200153.03	Date:	12/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	19.32	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		8.01	8434	14.5	1.73	21.4	—	cloudy	none	24.9
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve collected 13/6/23

WELL SAMPLING

SAMPLING METHOD ☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW76				
Analysis/ Bottles					

MW78

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	~~MW78~~
Job No:	BC200153.03	Date:	8/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	14.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	23.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	9.25	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		268

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity (Clear colour)	TDS (Age odour)	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
10:43	0	7.11	10387	-42.0	0.16	2.0	—	clear	none	24.8
10:49	60	7.07	10388	23	0.07	0.9	—	"	"	24.3
10:55	120	7.07	10390	18.8	0.01	0.1	—	"	"	24.3
11:03	180	7.08	10392	24.2	0.01	0.1	—	"	"	"
	220	7.08	10391	24.0	—	—	—	"	"	"
	240	7.08	10392	23.8	—	—	—	"	"	"
	260	7.08	10394	23.2	—		—	"	"	"
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	~~MW78~~ MW78				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW79
Job No:	BC200153.03	Date:	12/6/23
Recorded By:	DP	Time:	
Weather:	Clear		

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	11.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	19.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		Bailer Type: PVC SS Teflon Other	
Water Level Depth (WL in m BTOC):	0.89	Pump Type: Submersible Bladder Peristaltic Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	No Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
								colour	odour	
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	~~cloudy~~ ~~colour~~	~~odour~~	°C
		~~6.63~~	7091	45.6	1.12	13.0	—		none	21.7
		6.61								
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Hydrasleeve sampled 13/6/23

Discharge water disposal: Drums Other:

WELL SAMPLING

SAMPLING METHOD
Bailer – Type: PVC SS Teflon Other
Same as purge method
Pump – Type: Submersible Bladder Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW79				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW80
Job No:	BC200153.03	Date:	12/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	4.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	7.5

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	0.54	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	7.5	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		8.76	751	10.3	1.97	20.3		brown	none	18.5
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve sampled 13/6/23

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW80				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qtly	Well No:	MW96
Job No:	BC200153.03	Date:	14/6/23
Recorded By:	DP	Time:	9:30
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	0.7
Well Material:	☑ PVC ☐ SS _ Other:	Screen Interval – Top (m BTOC)	4.7 m
Well Head Condition:		Screen Interval – Bottom (m BTOC)	6.7 m

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	Dry	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	6.7 m	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: No sample collected, dry

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples					
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW97
Job No:	BC200153.03	Date:	13/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	0.68
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	2.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	2.72	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	4.00	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odor	Temp.
SWL										
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
~~2.98~~	~~15:03~~	~~0.5~~								
2.98	15:05	1	7.91	658	-4.1	3.81	45.6	—	murky	none	24.3
	Note:	Couldn't continue low flow sampling								
	~~1~~									
14/6/23	~4L	7.73	619	17.8	3.93	43.0	—	murky	none	19.6
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Couldn't stabilise on low flow, purged dry and sampled on 14/6/23

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	MW97				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calide Ally	Well No:	Bore X
Job No:	BC2.00153.03	Date:	13/6/23
Recorded By:	DP	Time:	10:20
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	N/A
Well Head Condition:		Screen Interval – Bottom (m BTOC)	N/A

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	2.96.	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	9.00	Depth (m BTOC): 8.0
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
		6.81	17648	57.5	3.39	40.8				22.9
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve collected 14/6/23

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	Bore X				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	ESC3
Job No:	Bc200153.03	Date:	
Recorded By:	DP	Time:	8/6/23
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	17.4
Well Head Condition:		Screen Interval – Bottom (m BTOC)	20.4

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		Bailer Type: PVC SS Teflon Other
Water Level Depth (WL in m BTOC):	6.23	Pump Type: Submersible Bladder Peristaltic Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	20.4	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? No Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		148
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
11:30	20	6.99	8941	-118.5	0.39	4.4	—	Clear	H2S	23.3
11:36	60	6.97	8736	-96.3	0.13	1.1	—	〃	〃	23.4
11:39	80	6.97	8933	-88.5	0.04	0.5	—	〃	〃	23.4
11:42	100	6.97	8928	-81.5	—	—	—	〃	〃	〃
11:45	120	6.97	8930	-79.0	—	—	—	〃	〃	〃
11:48	140	6.97	8931	-72.3	—	—	—	〃	〃	〃
~~11:51~~										
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: Drums Other:

WELL SAMPLING

SAMPLING METHOD
Bailer – Type: PVC SS Teflon Other
Same as purge method
Pump – Type: Submersible Bladder Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	ESC3				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	ES C4
Job No:	BL200153-03	Date:	8/6/23.
Recorded By:	DP.	Time:	
Weather:	Clear		

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME

LNAPL Level Depth (LL in m BTOC):	
Water Level Depth (WL in m BTOC):	6.89.
DNAPL Level Depth (DL in m BTOC):	
Total Depth of Well (TD in m BTOC):	
Height of Standing Water Column (TD-WL, in m):	

PURGE METHOD

☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other

PUMP INTAKE SETTING

Depth (m BTOC):

Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)

[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge

Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		7.02	8237	-24.6	1.24	15.0		Clear	none	23.5
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Hydrasleeve, sampled 12/6/23

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	ESC4				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN130801/2
Job No:	BC200153.03	Date:	12/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	8.72	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: No Sample, can't get hydrasleeve down well

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples					
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN130126
Job No:	BC200153.03	Date:	10/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):	6.3	☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	10.26	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):	19.6	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
Minimum Purge Volume Required	50	100		3.5		94
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity ~~clear~~ colour	TDS ~~clear~~ odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
	0	6.95	520	-97.5	0.34	4.0	—	clear	none	24.4
	20	6.67	553	-62.5	0.13	1.6	—	clear	none	24.5
	40	6.61	553	-30.0	0.04	0.4	—	clear	none	24.5
	60	6.60	553	-15.8	0.00	—	—	〃	〃	24.4
	80	6.61	554	-10.5	—	—	—	〃	〃	24.5
	90	6.61	554	-9.7	—	—	—	〃	〃	24.5
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN130126				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN130301 27
Job No:	BC200153.03	Date:	9/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	15.3
Well Head Condition:		Screen Interval – Bottom (m BTOC)	17.4

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	10.50	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
Minimum Purge Volume Required	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
9/6/23		6.76	907	-136.1	0.25	3.6	—	brown	none	28.7
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): Purged 10L, water level 13.73m second visit

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN130301 27				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN13030692
Job No:	BL200153.03	Date:	9/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	15.7
Well Head Condition:		Screen Interval – Bottom (m BTOC)	16.7

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		Bailer Type: PVC SS Teflon Other	
Water Level Depth (WL in m BTOC):	10.30	Pump Type: Submersible Bladder Peristaltic Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	17.21	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	No Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		72
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
	0	6.80	489	56.3	2.66	31.5	—	clear	none	24.4
	20	6.71	489	60.1	2.10	25.5	—	"	"	"
	40	6.64	489	65.8	2.07	24.7	—	"	"	"
	60	6.63	488	67.6	1.98	23.4	—	"	"	"
	70	6.62	488	67.9	1.93	22.9	—	"	"	"
	80	6.62	488	68.1	1.92	22.7	—	"	"	"
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: Drums Other:

WELL SAMPLING

SAMPLING METHOD
Bailer – Type: PVC SS Teflon Other
Same as purge method
Pump – Type: Submersible Bladder Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN13030692				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN1303069?
Job No:	BE200153.03	Date:	9/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	12.7
Well Head Condition:		Screen Interval – Bottom (m BTOC)	13.7

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	9.25	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
9/6/23		6.87	1295	-47.1	3.05	37.8	—	grey	none	27.4
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: purged ~6L dry. WL 10.99 m when sampling

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	RN1303069?				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN13030698
Job No:	BC200153.03	Date:	9/6/23
Recorded By:		Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor / Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	PVC SS Other:	Screen Interval – Top (m BTOC)	17.2
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.2

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	8.68	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	19.11	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		109
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
	0	6.74	2285	55.6	1.72	20.2	—	clear	none	23.5
	20	6.70	2396	64.8	1.33	15.2	—	clear	none	23.5
	40	6.62	2298	65.8	1.18	14.1	—	"	"	23.6
	60	6.62	2300	66.8	1.13	13.4	—	"	"	"
	80	6.61	2312	68.3	1.17	13.9	—	"	"	"
	100	6.61	2313	68.9	1.19	14.0	—	"	"	"
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	RN13030698	BD01_0906	SD01_0906		
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN130307 15
Job No:	BC200153.03	Date:	10/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	11.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.0

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	9.55	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	18.00	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		89
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
SWL 9.80	~~200~~ 0	7.18	2608	22.3	6.48	77.5	—	cloudy	none	23.9
"	~~400~~ 20									
" 10:10	40	7.17	2620	42.0	6.83	81.2	—	clear	none	23.9
" 10:13	60	7.16	2623	49.1	7.08	84.5	—	clear	none	23.9
"	80	7.15	2630	53.4	7.10	84.7	—	"	"	"
"	90	7.15	2628	57.6	7.13	84.8	—	"	"	"
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	RN130307 15	BD03_1006	SD03_1006		
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	LOO5-B01
Job No:	BC200153.03	Date:	13/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		7.32	1957	31.2	5.58	64.8		clear	none	22.4
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	LOO5-B01				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	L006-BO5
Job No:	BC200153.03	Date:	7/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	10 min	6.57	2756	79.8	5.36	61.9				22.0
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	L006-BO5				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	L012-B01
Job No:	BE200153.03	Date:	14/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☐ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
	10 min	6.68	1260	22.6	1.57	18.1	—	clear	none	22.8
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	L012-B01	BD05_1406	SD05_1406		
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	L021-B01
Job No:	BC200153.03	Date:	12/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor / Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	_ PVC ☐ SS _ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	10 min	6.73	626	48.1	3.02	37.4				26.3
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	L021-B01				
Analysis/ Bottles					

SURFACE WATER FIELD MONITORING SHEET

Job Name:	Call.de Qily		Recorded By: DP
Job number:	BE200153.03		Date: ~~22/6/23~~ 6/6/23

Sampling Data

Sample ID	QAQC ID	Field Parameters (Specify Units)							
		NTU	pH	EC	°C	Redox	TDS	DO mg/L	DO%
DRD			8.57	5989	21.7	56.4		9.57	117.5
PW2			8.27	9296	21.4	59.4		8.88	103.7
SW12			7.97	557	18.6	52.7		8.22	88.1
SW22			7.49	1008	17.9	61.3		3.02	33.1
SW40			7.17	972	17.7	62.2		2.32	24.4
L006-BOS			6.57	2756	22.0	79.8		5.36	61.9
Notch-V1			7.46	13773	~~3~~ 14.6	79.3		5.95	62.3
Notch-V2			7.98	13673	14.8	73.1		8.70	91.4
SW36			8.95	394	18.5	19.3		10.15	108.6
SW20	BD02_1006 / SD02_1006		8.81	392	~~33.5~~ 18.7	33.3		8.41	90.6
PW1			8.11	6631	19.1	41.8		7.42	82.1

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	
					Other ~~surface water~~ locations were dry, borrow pit A inaccessible due to ~~low water~~ shallow water ~~depth~~
					BD02_1006 / SD02_1006 taken from SW20

SURFACE WATER FIELD MONITORING SHEET

Job Name:	Collide Ally		Recorded By: DP
Job number:	BE20153.03		Date: 12/6/23

Sampling Data

Sample ID	QAQC ID	Field Parameters (Specify Units)						
		NTU	pH	EC	°C	Redox	TDS	DO mg/L (DO %)
~~SW11~~ (L021-B01)			6.73	626	26.3	48.1		3.02 (37.4)
~~L021-B01~~ SW11			7.68	969	19.4	26.4		4.36 (47.6)
~~SW11~~	SW02		7.43	514	21.6	58.4		5.93 (66.3)

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	
					Remaining surface water locations were dry

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003871 WATER QUALITY METER – MULTIFUNCTION

Plant Number: 1100709

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	393181 397396	☑
Conductivity	2.76 mS/cm @ 25°C	2.76 mS/cm		396172	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.0% in Sodium Sulphite	% Saturation in Air	12110	☑
ORP	240mV @ 25°C	240mV	-	398884/395163	☑

Battery Status 100 %	Temperature 21 °C
	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: C.Lynch Date: 1/9/23 Signed: [signature]

Accessories List:

User's Manual & USB	pH Sensor	Conductivity Sensor
Dissolved Oxygen Sensor with Wetting Cap	Redox (ORP) Sensor with Wetting Cap	Flow Cell 500ml
Comm Cable	Testing Cap	Storage Cap

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003842-9003846 - INTERFACE METER

Plant Number: 235280

Probe Length: 60MT

ITEM	TEST	PASS	COMMENTS
Battery	Compartment / Capacity	☑	9v
Probe	Clean / Operation	☑	
Earth Lead	Check if equipped	☑	
Tape Check	Cleaned / Checked for cuts	☑	
Function test	At surface level	☑	

Note: Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Joshua Roy Date: 14/08/23 Signed: _____

Accessories List:

Interface Meter	Tape Guide	Decon 90 Solution
Brush	Spare 9v Battery	Instruction Manual
Transport Box		

DAILY LOG

DATE:	4/9/23
TIME START:	~~11:00~~ 5:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: Call:de Qtly

Other Field Staff: Dave Laurence (ES)

Project Manager: Luke Amres

Contractors:

PRE START

Planned tasks for the Day:

- Mobilise to site
- Start SW sampling

Equipment in use:

- YSI
- LV

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See Shms			

DATE:	4/9/23
TIME START:	~~8:00~~ 5:a
TIME END:	16:00

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Left Brisbane at 6:25 from airport
- Arrived in Gladstone at 8:30
- Arrived ~~in Bibaa~~ on site at 10:45
- Commenced surface water sampling ~~at~~, majority of locations were dry
- Left site at 16:00

Daniel Paprzak

DAILY LOG

DATE:	5/9/23
TIME START:	7:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: Callide Quarterly Monitoring

Other Field Staff: Dare Lawrence

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Commence GW sampling

Equipment in use:

- ~~PACO~~ monsoon pump
- LV
- YSI
- IP

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	5/9/23
TIME START:	7:00
TIME END:	16:00

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- 7:00 arrived on site
- Commenced GW sampling, dropped hydrasleeves
- 16:00 - Left site

Panel Replaced

DAILY LOG

DATE:	6/9/23
TIME START:	7:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: Callide Qtly

Other Field Staff: Dare Lawrence

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- GW Sampling

Equipment in use:

- LV
- YSI
- Marsden pump
- IP

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	6/9/23
TIME START:	7:00
TIME END:	16:00

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start on site at 7:00
- E undertook GW sampling
- Left site at 16:00

Daniel Papworth

DAILY LOG

DATE:	7/9/23
TIME START:	7:00
TIME END:	16:30

Project No: BC200153.03

Recorded By: DP

Project/Site: Collide 2Hy

Other Field Staff: Dave Laurence

Project Manager: Luke Annies

Contractors:

PRE START

Planned tasks for the Day:

- perform GW sampling

Equipment in use:

- LV
- IP
- YSI
- monsoon pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DAILY LOG

DATE:	7/9/23
TIME START:	7:00
TIME END:	16:30

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start on site at 7:00
- perform GW sampling and landowner bore sampling
- Left site at 16:30

Daniel Papineau

DAILY LOG

DATE:	8/9/23
TIME START:	7:00
TIME END:	~~16:30~~ 16:00

Project No: BC200153.03

Recorded By: OP

Project/Site: Callide Qtly

Other Field Staff: Dare Lawrence

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- perform GW sampling / landholder bore sampling

Equipment in use:

- LV
- IP
- YSI
- Monsoon pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DAILY LOG

DATE:	8/9/23
TIME START:	7:00
TIME END:	16:00

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start on site at 7:00
- perform GW and landowner bore sampling
- Left site at 16:00

Daniel Pannach

DAILY LOG

DATE:	9/9/23
TIME START:	7:30
TIME END:	16:00

Project No: BC200153.03 / BC200153.02

Recorded By: DP

Project/Site: Callide Qtly / Landowner sampling

Other Field Staff: Dare Lawrence

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- ~~Perform GW~~ Finish GW/SW sampling for Quarterly event
- perform landowner sampling

Equipment in use:

- YSI
- LV
- IP
- Monsoon pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DAILY LOG

DATE:	9/9/23
TIME START:	7:30
TIME END:	16:00

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Start GW sampling at 7:30
- Finished GW sampling at 10:20 } BC200153.03
- Sampled SW45 at 10:45 }
- Sampled LO49-B01 at 12:00 } BC200153.02
- Sampled LO84-B01 / B02 at 12:45 }
- Sorted out samples and prepared COC on site } BC200153.03
- Left site at 16:00 }

Daniel Papineau

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	~~BG200153.03~~ MW09
Job No:	BG200153.03	Date:	6/9/23
Recorded By:	DP	Time:	9:30
Weather:	Hot, clear		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	7.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	10.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	7.07	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):	10.28	Depth (m BTOC): 9.5	
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L	

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS Odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
9:30	1		7.20	6.81	11527	-134.2	0.08	0.9		grey	none	24.5
9:32	2		7.24	6.83	11542	-130.2	0.06	0.7		cloudy	none	24.5
9:34	3		7.25	6.83	11555	-126.4	0.08	1.0		cloudy	none	24.6
	4		7.25	6.83	11615	-119.4	0.12	1.4		"	"	24.7
	5		7.26	6.83	11656	-116.0	0.12	1.5		clear	"	25.0
	6		7.26	6.83	11686	-111.0	0.09	1.1		clear	"	25.0
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD ☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW09			RBD1060	
Analysis/ Bottles				from EP	

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW32
Job No:	BC200153.03	Date:	7/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	22.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	25.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	16.74	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	25	Depth (m BTOC):	24.0
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	1			6.55	6403	-35.0	3.97	48.2		cloudy	H_2S	24.3
	3		6.53		6546	-48.7	2.95	36.7		clear	none	25.2
	5		6.52		6591	-52.1	2.50	31.4		"	"	25.6
	6		6.51		6593	-51.7	2.34	30.1				
	7			6.51	6595	-50.1	2.17	27.0				
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW32	BD02_0709	SD02_0709		
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW40
Job No:	BC200153.03	Date:	5.9.23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	5.46	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
				6.84	8532	-10.8	0.99	12.4		clear	none	25.3
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Hydrasleeve dropped 5/9/23, collected 6/9/23

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW40			RB01_0509	
Analysis/ Bottles				from IP	

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW42
Job No:	BC200153.03	Date:	6/9/23
Recorded By:	DP	Time:	8:00
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	19.2
Well Head Condition:		Screen Interval – Bottom (m BTOC)	25.2

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	10.24	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	25	Depth (m BTOC):	23.0
Height of Standing Water Column (TD-WL, in m):	14.76	Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
8:00	20		10.28	6.93	9870	-114.1	—	—		cloudy	none	24.7
8:05	40		10.32	6.93	9842	-102.9	0.08	1.0		brown	H2S	24.6
8:09	60		10.32	6.92	9880	-121.3	—	—		brown	H2S	24.6
	80		10.32	6.92	9906	-97.8	—	—		clear	none	24.6
	100		"	6.92	9908	-95.7	—	—		"	"	"
	120		"	6.92	9914	-92.8	—	—		"	"	"
	140		"	"	9912	-93.1	—	—		"	"	"
	150		"	"	9910	-93.6	—	—		"	"	"
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW42				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW43
Job No:	BC200153.03	Date:	7/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	24.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	30.4

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	8.71	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	27.0
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
8:30	1		9.34	6.78	6954	-134.1	3.31	40.4		clear	strong H2S	24.7
8:32	2		9.38	6.72	7059	-87.8	2.48	30.2		pink	H2S	24.6
	3		9.42	6.75	7088	-101.8	2.59	31.6		pink	faint H2S	24.5
	4		9.46	6.73	6951	-103.6	2.35	28.6		cloudy	none	24.4
	5		9.48	6.71	7042	-102.8	2.55	31.2		clear	none	24.5
	6		9.50	6.71	7037	-104.0	2.22	27.7		"	"	"
	7		9.50	6.71	7066	-101.7	2.01	24.6		"	"	"
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW43				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calliide Qtly	Well No:	MW49
Job No:	BC200153.03	Date:	5.9.23
Recorded By:	OP	Time:	
Weather:	Cloudy		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	9.30	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
				6.75	14016	-64.0	0.62	7.9		clear	none	25.3
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Hydrasleeve dropped 5/9/23, collected 6/9/23

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW49				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Qty	Well No:	MW56
Job No:	BC200153.03	Date:	5/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):		Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Grey Dry

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW59
Job No:	BC200153.03	Date:	8/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	5.66	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	~15	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
				7.57	10431	80.3	2.05	24.4		clear	none	22.3
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Hydrasleeve dropped 7/8/23, collected 8/9/23

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW59				
Analysis/ Bottles					

~~LOW FLOW~~ GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW68
Job No:	BC200153.03	Date:	7/9/23
Recorded By:	DP	Time:	
Weather:	Hot, Clear		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	10.69	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	17	Depth (m BTOC):	16m
Height of Standing Water Column (TD-WL, in m):	6.31	Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	colour	colour	°C
	20		10.74	6.79	8406	-9.7	2.54	30.2		brown	none	
9:00	40		10.74	6.79	8457	-18.5	1.01	12.2		clear	none	23.6
9:05	60		10.74	6.79	8468	-22.5	0.43	5.1		"	"	"
9:10	70		"	6.79	8469	-26.6	0.18	2.2		"	"	"
	80											
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW68				
Analysis/ Bottles					

~~LOW-FLOW~~ GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW72
Job No:	BC200153.03	Date:	5/9/23
Recorded By:	DP	Time:	
Weather:	Hot, Clear		

CONSTRUCTION INFORMATION

Well Type:	☑ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	8.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	17.5

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	13.73	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	17.70	Depth (m BTOC):	15.0
Height of Standing Water Column (TD-WL, in m):	3.97	Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS odor	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
14:00	0		13.80	6.71	735	-0.5	1.62	18.4		clear	none	21.8
14:04	20		13.81	6.69	732	-10.4	0.75	8.5		"	"	21.6
	40		13.81	6.69	731	-5.5	0.49	5.6		"	"	21.7
	50		"	6.69	732	-5.1	0.48	5.3		"	"	21.8
	60		"	6.69	732	-4.8	0.46	5.2		"	"	21.8
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW72	BD01_0509	SD01_0509		
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW73
Job No:	BC200153.03	Date:	5/9/23
Recorded By:	OP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	10.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	19.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	12.69	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	17.67	Depth (m BTOC):	17.0
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Color	TDS color	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
13:17	20		~~12.69~~	6.29	2336	-153.1	0.62	7.7		cloudy	~~#25~~	24.4
13:23	40		12.74	~~6.24~~ 6.30	2341	-~~155~~.1	0.39	4.4		clear	none	24.4
	60		12.74	6.30	2342	-149.2	0.09	1.1		"	"	"
	70		"	6.30	2341	-148.8	0.07	0.9		"	"	"
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW73				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:	30200153.03	Well No:	MW74
Job No:	Calliide Qtly	Date:	5/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	11.38	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
				7.09	3353	-49.1	1.09	12.4		cloudy	none	22.1
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Hydrasleeve dropped 5/9/23, sampled 6/9/23

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD ☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW74				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW28
Job No:	BC200153.03	Date:	5/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☒ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	14.2
Well Head Condition:		Screen Interval – Bottom (m BTOC)	25.2

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☒ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	9.62	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	20.0
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity odour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	20			7.08	10593	78.8	0.13	1.6		clear	none	24.4
	60			7.08	10490	28.6	0.06	0.7		〃	〃	〃
	100			7.08	10483	24.8	0.03	0.4		〃	〃	〃
	140			7.08	10482	22.3	0.01	0.1		〃	〃	〃
	180			7.08	10478	19.7	0.01	0.1		〃	〃	〃
	220			7.08	10465	17.4	0.01	0.1		〃	〃	〃
	260			7.08	10460	15.4	0.01	0.1		〃	〃	〃
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW28				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW80
Job No:	BC200153.03	Date:	5/9/23
Recorded By:	DP	Time:	14:25
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	1.67	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
				7.05	4039	-107.9	1.22	14.7		clear	none	23.9
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Hydrasleeve dropped at 5/9/23, collected 6/9/23

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW80				
Analysis/ Bottles					

~~LOW FLOW~~ GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW81
Job No:	BC200153.03	Date:	8/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	16.0
Well Head Condition:	Monument, Good	Screen Interval – Bottom (m BTOC)	22.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	9.20	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	22.0	Depth (m BTOC): 20.0	
Height of Standing Water Column (TD-WL, in m):	12.8	Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
14:41	20		9.30	6.90	6486	-113	0.35	4.0		clear	none	24.7
14:46	40		〃	6.92	6753	-19.2	0.04	0.4		〃	〃	24.7
	60		〃	6.92	6770	-22.6	0.07	0.9		〃	〃	〃
	80		〃	6.90	6772	-25.2	—	—		〃	〃	〃
	100		〃	6.89	6779	-23.2	0.09	0.9		〃	〃	〃
	120		〃	6.89	6778	-22.8	0.07	0.9		〃	〃	〃
	140		〃	6.89	6776	-24.5	0.05	0.7		〃	〃	〃
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW81				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW82
Job No:	BC200153.03	Date:	9/9/23
Recorded By:	OP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	18.0
Well Head Condition:	Monument, good	Screen Interval – Bottom (m BTOC)	24.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	8.12	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	24.5	Depth (m BTOC): 22.0m	
Height of Standing Water Column (TD-WL, in m):	16.38	Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odor	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
10:06	20		8.22	7.14	9428	40.1	1.76	21.2		clear	none	24.2
10:10	40		8.23	7.10	9432	4.5	0.14	1.6		clear	none	24.2
10:14	60		8.23	7.12	9526	-4.1	0.03	0.4		"	"	"
	80		8.23	7.17	9702	-9.0	—	—		"	"	"
	100		8.23	7.20	9773	-11.8	—	—		"	"	"
	120		"	7.21	9816	-11.9	—	—		"	"	"
	140		"	7.21	9827	-12.8	—	—		"	"	"
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW82				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW83
Job No:	BC200153.03	Date:	9/9/23
Recorded By:	OP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	17.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	23.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	5.99	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	22.70	Depth (m BTOC): ~~20~~ 21.0	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	10		6.50	6.98	7835	68.4	0.48	5.5		cloudy	none	23.0
	11		6.52	6.98	7823	61.6	0.20	2.4		cloudy	none	22.9
	12		6.52	6.98	7822	60.8	0.06	0.7		clear	none	22.9
	13		6.52	6.97	7820	60.5	0.06	0.7		clear	none	22.9
	14		6.53	6.97	7822	59.4	0.06	0.7		"	"	"
	15		6.53	6.97	7818	59.3	0.06	0.8		"	"	"
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

switched to low flow at 10L

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW83				
Analysis/ Bottles					

~~LOW FLOW~~ GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calliope Qtly	Well No:	MW84
Job No:	BC200153.03	Date:	8/9/23
Recorded By:	OF	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☑ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	12.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☑ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	6.46	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	18.50	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
	20		~~6.85~~ 6.75	6.85	5579	9.5	0.14	1.7		clear	none	25.0
	40		〃	6.79	5543	8.9	0.02	0.2		〃	〃	24.9
	60		〃	6.78	5555	14.5	0.14	1.5		〃	〃	24.9
	80		〃	6.78	5551	14.5	0.09	1.1		〃	〃	〃
	100		〃	6.78	5550	14.3	0.06	0.8		〃	〃	〃
	120		〃	6.77	5545	14.2	0.06	0.7		〃	〃	〃
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Same as purge method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Pump – Type: ☑ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW84				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Calliope Qtly	Well No:	MW85
Job No:	BC200153.03	Date:	8/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	9.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	15.5

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	6.21	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	~~7~~ 13.5	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
SWL 7.00	20	12.29	10848	-166.2	0.60	7.4		clear	none	24.3
	21	12.27	10879	-167.7	0.37	4.6		"	"	24.9
13:17	22	12.25	10977	-168.8	0.35	4.5		"	"	25.7
13:18	23	12.22	11163	-169.9	0.31	4.0		"	"	26.0
	24	12.23	11150	-170.1	0.27	3.5		"	"	26.3
	25	12.23	11146	-172.5	0.28	3.7		"	"	26.4
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour): swapped to low flow

Discharge water disposal: ☐ Drums ☐ Other:

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples	MW85			RBSL_0809	
Analysis/ Bottles				from pump	

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW86
Job No:	BC200153.03	Date:	8/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	9.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	15.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	15 dry	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):	15.60	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Dry, no tubing put down well

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW89
Job No:	BC200153.03	Date:	7/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	5.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	11.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	8.03	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	12	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Color	TDS odor	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
13:30	1		8.21	6.80	7663	30.3	0.21	2.5		pink	none	24.6
13:31	2		8.21	6.81	7590	19.0	0.14	1.7		pink	none	24.5
	3		8.22	6.81	7571	11.4	0.15	1.8		cleaning	none	24.5
	4		8.22	6.81	7560	8.8	0.13	1.7		"	"	24.4
	5		8.22	6.81	7558	6.7	0.13	1.6		"	"	24.4
	6		8.22	6.81	7556	5.0	0.12	1.4		"	"	"
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW89				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW90
Job No:	BC200153.03	Date:	7/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	21.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	27.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	7.20	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	31.0	Depth (m BTOC):	25.0
Height of Standing Water Column (TD-WL, in m):	23.8	Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
	20		7.70	6.84	8002	16.7	0.07	0.8		clear	none	24.1
	40		7.77	6.83	8027	15.1	0.02	0.2		"	"	24.1
	60		7.80	6.83	8033	19.0	0.03	0.4		"	"	24.0
	80		7.83	6.83	8075	21.9	0.04	0.5		"	"	24.2
	100		7.83	6.83	8089	23.1	0.04	0.5		"	"	"
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW90				
Analysis/ Bottles					

~~LOW FLOW~~ GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW91
Job No:	BC200153-03	Date:	8/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	12.1
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.1

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	10.42	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	19.17	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):	8.75	Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	odor	odor	°C
	0		10.43	6.87	3511	-76.9	2.73	31.8		grey	slight	24.6
	20		10.44	6.86	4012	-95.7	0.90	10.9		murky	H2S	24.7
	40		10.46	6.86	4038	-73.9	1.12	13.6				
	60											
	~~80~~			~~6.90~~		~~-40.0~~	~~5.86~~					
	80		10.46	6.85	4024	-40.1						
	100		10.46	6.87	3997	-35.7	1.34	16.5				
	120		10.46	6.87	3981	-30.9	1.48	17.8		clear	none	24.8
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW91				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET MW94

Job Name:		Well No:	~~BC200153.03~~
Job No:	BC200153.03	Date:	8/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	19.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	25.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	9.95	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	26.0	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	0		10.10	7.10	10583	2.1	1.12	13.5		clear	none	24.6
	20		10.12	7.11	10574	-18.8	0.14	1.7		"	"	24.5
	40		10.12	7.11	10605	-28.8	0.29	3.2		"	"	24.6
	60		"	7.10	10585	-24.0	0.23	2.5		"	"	"
	80		"	7.10	10801	-22.9	0.25	4.0		"	"	"
	100		"	7.10	10596	-26.2	0.18	1.6		"	"	"
	120		"	7.09	10573	-28.0	0.10	1.2		"	"	"
	140		"	7.09	10575	-29.3	0.06	0.9		"	"	"
	160		"	7.08	10574	-30.8	0.04	0.6		"	"	"
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW94				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW97
Job No:	BC200153.03	Date:	7/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	2.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	4.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	3.51 / 3.54	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	4.00	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Color	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
				7.75	686	36.0	3.36	36.8		brown	none	20.0
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):
purged dry 7/9/23 (~¾ L). Sampled 8/8/23

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW97				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW98
Job No:	BC200153.03	Date:	8/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	12.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	9.67	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	18.77	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	0		10.20	7.57	7757	16.0	2.25	28.5		clear	none	26.3
	1		10.30	7.56	7755	14.3	2.16	27.3		clear	none	26.2
	2		10.35	7.57	7877	14.0	2.02	25.9		"	"	27.0
	3		10.39	7.56	7961	14.8	1.99	25.8		"	"	27.4
	4		10.42	7.55	7805	11.1	2.03	25.9		"	"	26.5
	5		10.46	7.53		11.4				"	"	
	5.5		10.47	7.53		11.7				"	"	
	6		10.48	7.53	7841	11.5	2.02	25.8		"	"	26.8
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Difficult to low flow, recommend purging dry

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	MW98				
Analysis/ Bottles					

~~LOW FLOW~~ GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN130301 26
Job No:	BC200153.03	Date:	7/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	10.90	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):	19.37	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odor	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV −61.4	ppm	% Sat	NTU			°C
10:00	20		10.91	6.66	588	~~62.7~~ →	1.43	17.0		clear	none	24.6
10:05	40		10.91	6.65	588	-29.9	0.68	7.0		"	"	"
	60		"	6.65	588	-23.5	0.22	2.5		"	"	"
	80		"	6.64	589	-18.9	0.12	1.4		"	"	"
	90		"	6.63	589	-18.8	0.08	1.0		"	"	"
	100		"	6.63	589	-18.2	0.06	0.8		"	"	"
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	RN130301 26	BD03_0709	SD03_0709		
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN13030127
Job No:	BC200153.03	Date:	5/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	10.72 / 13.40	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	15.60	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity (colour)	TDS (odour)	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
				7.00	892	-150.4	0.60	7.6		grey	none	30.0
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Purged dry on 5/9/23 ~ 10L purged

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	RN13030127				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN13030692
Job No:	BC200153.03	Date:	5.9.23
Recorded By:	DP	Time:	
Weather:	Hot, clear		

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	15.7
Well Head Condition:		Screen Interval – Bottom (m BTOC)	16.7

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	10.63	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	17.5	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU	_____	_____	°C
	20											
12:00	40		10.63	6.63	517	95.2	1.70	20.5		clear	none	24.9
12:04	60		10.63	6.62	515	92.0	1.87	22.8		"	"	"
12:06	80		"	6.61	517	91.7	1.77	21.4		"	"	"
12:08	80		"	6.61	517	90.8	1.74	21.1		"	"	"
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	RN13030692				
Analysis/ Bottles					

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RM13030697
Job No:	BC200153.03	Date:	5/9/23
Recorded By:		Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☒ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Water Level Depth (WL in m BTOC):	9.38	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING
Total Depth of Well (TD in m BTOC):	12.30	Depth (m BTOC):
Height of Standing Water Column (TD-WL, in m):		Purged dry? ☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Color	TDS odor	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
		7.02	1410	-134.2	0.43	5.6		Grey	none	28.3
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Purged Dry on 5/9/23, Sampled 6/9/23

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate	Comments
	RM13030697				
Analysis/ Bottles					

~~LOW FLOW~~ GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RM303069~~8~~
Job No:	BC200153.03	Date:	5/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	17.2
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.2

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	8.78	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	19.0	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):	10.22	Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity	TDS	Temp.
										odor	odor	
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
	0		8.78	6.57	2655	92.7	2.21	25.9		clear	none	24.0
	20		〃							〃	〃	〃
	40		〃	6.59	~~7~~2653	90.5	1.34	16.2		〃	〃	〃
	60		〃	6.59	2650	85.7	1.09	13.1		〃	〃	〃
	80		〃	6.59	2648	84.0	1.03	12.1		〃	〃	〃
	100		〃	6.59	2646	83.1	1.00	11.7		〃	〃	〃
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

100L purge required

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	RM303069~~8~~				
Analysis/ Bottles					

~~LOW FLOW~~ GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	RN1303071S
Job No:	BC200153.03	Date:	5/9/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	11.0
Well Head Condition:		Screen Interval – Bottom (m BTOC)	18.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	9.80	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	14.6	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):	4.80	Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Color	TDS Odor	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
	20		9.89	7.07	2819	80.0	6.06	72.9		cloudy	mild H2S	24.1
	40		〃	7.08	2824	80.9	6.09	73.3		〃	none	24.1
	~~50~~ 50		〃	7.08	2822	81.1	6.10	73.4		〃	〃	〃
	60		〃	7.08	2821	81.3	6.10	73.0		〃	〃	〃
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	RN1303071S				
Analysis/ Bottles					

LOW FLOW GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	ES4
Job No:	BL20153.03	Date:	5.9.23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	☐ Monitor ☐ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	
Well Material:	☐ PVC ☐ SS ☐ Other:	Screen Interval – Top (m BTOC)	
Well Head Condition:		Screen Interval – Bottom (m BTOC)	

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
Water Level Depth (WL in m BTOC):	7.16	Initial Pump Rate (L/min)	
DNAPL Level Depth (DL in m BTOC):		**PUMP INTAKE SETTING**	
Total Depth of Well (TD in m BTOC):		Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

In accordance with USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504), draw down to be limited to <0.1m during sampling. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology and flow rates up to 1 L/min may be acceptable where draw down is able to be maintained at <0.1m.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	Pump Rate	SWL	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity colour	TDS odour	Temp.
HH:MM	L	L/min	m BTOC	-	µS/cm	mV	ppm	% Sat	NTU			°C
				6.97	8731	53.4	0.93	@ 11.4		clear	none	24.5
Acceptable Variation			<0.1m	± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N												

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504).

Observations during purging (well condition, turbidity, colour, odour):

Hydrasleeve dropped 5/9/23, collected 6/9/23

Discharge water disposal: ☐ Drums Other

WELL SAMPLING

SAMPLING METHOD

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☐ Same as purge method

☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate Blank	Comments
	ESC4				
Analysis/ Bottles					

SURFACE WATER FIELD MONITORING SHEET

Job Name:		Recorded By:	DP
Job number: BC200153.03		Date:	

Sampling Data

	Sample ID	QAQC ID	Field Parameters (Specify Units)							
			NTU	pH	EC	°C	Redox	TDS	DO %	ppm
5/9/23	L006-B05			6.57	4394	25.6	66.8		56.0	4.54
7/9/23	L005-B01			7.31	2184	27.1	46.3		59.8	4.7
7/9/23	L021-B01	BD04_0706		6.62	784	30.5	47.4		24.3	1.80
8/9/23	L012-B01			6.63	1274	24.3	87.5		30.0	2.48
9/9/23	SW22			8.27	1609	28.1	36.2		105.3	8.20
	SW12			8.10	3509	27.8	34.7		102.4	7.95
	~~DRD~~ AW2			8.45	10038	24.2	45.2		73.7	5.98
	DRD			8.68	11398	25.6	37.7		85.1	6.74
9/9/23	SW45			9.00	1271	24.6	20.5		73.0	6.47

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	

DAILY LOG

DATE:	4/12/23
TIME START:	14:30
TIME END:	20:30

Project No: BC200153.03 Recorded By: DP

Project/Site: CS Energy ~~Callide~~ Quarterly Monitoring Other Field Staff: DL

Project Manager: Luke Amies Contractors:

PRE START

Planned tasks for the Day:

Mobilise to Biloela

Equipment in use:

LV

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Leave for airport at 14:30
- Arrive in ~~BT~~ Gladstone at ~~18~~ 18:15
- Arrive in Biloela at 20:15

Email Signed

Note for ~~BT~~ YSI results throughout program:

- YSI had some connectivity issues that caused inaccurate pH / ORP readings at certain sites, ~~these data has been~~ these samples have been noted in the field parameter database

DAILY LOG

DATE:	5/12/23
TIME START:	7:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: CS Energy Quarterly Monitoring

Other Field Staff: ~~DP~~ Dare Lawrence

Project Manager: Luke Finies

Contractors: (CS Energy)

PRE START

Planned tasks for the Day:

- ~~B~~ Meet with client
- Finish surface water sampling

Equipment in use:

- LV
- Sampling pole
- YSI

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Arrived to site at 7:00
- Met with client to discuss program / safety docs
- Completed surface water sampling scope throughout the day
- Left site at 15:45

DAILY LOG

DATE:	6/12/2023
TIME START:	7:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: CS Energy Quarterly Monitoring

Other Field Staff: DL

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Begin groundwater sampling

Equipment in use:

- LV
- YSI
- Mega Monsoon
- IP

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Arrive to site at 7:00
- Completed groundwater sampling within WCF
  - MW86 dry
- Left site at 15:45

DAILY LOG

DATE:	7/12/2023
TIME START:	7:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: CS Energy - Quarterly Sampling

Other Field Staff: DL

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Complete groundwater sampling

Equipment in use:

- LV
- IP
- YSI
- Monsoon pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See Storms

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Arrived to site at 7:00
- completed groundwater sampling within WCF
- Left site at 15:45

Not Required

DAILY LOG

DATE:	8/12/23
TIME START:	7:00
TIME END:	16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: CS Energy - Quarterly Monitoring

Other Field Staff: DL

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- complete groundwater sampling
- Sample weir (SW41)

Equipment in use:

- LV
- IP
- YSI
- Monsoon Pump
- Sampling pole

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See Sitms			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Arrived to site at 7:00
- Completed groundwater sampling outside of WCF
  - ~~AMW3, AMW8~~,
  - ~~BH13~~ (SW41)
- Went to stormwater weir at ~~13:00~~ 13:00
- Sampled LO21-301 at 14:00
- Sampled RN13030692 at 14:30
- Left site at 16:00

Daniel Rajnish

DAILY LOG

DATE:	9/12/23
TIME START:	7:00
TIME END:	11:30

Project No: BL200153.03

Recorded By: DP

Project/Site: Callide Qtly Monitoring

Other Field Staff: DL

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Complete offsite groundwater bore sampling

Equipment in use:

- LV
- IP
- VSL
- Monsoon Pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Started work at 7:00
- Sampled groundwater bores offsite
- Finished work at 11:30, collected ice to chill samples
- ~~Completed~~

Note: no field notes for 10/12/23, was an RDO day (no fieldwork)

Kanad Rajnard

DAILY LOG

DATE:	11/12/23
TIME START:	7:00
TIME END:	~~15:45~~ 16:00

Project No: BC200153.03

Recorded By: DP

Project/Site: Callide Qtly Monitoring

Other Field Staff: Sharon Geall (CS Energy)

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- complete ~~offsite~~ groundwater sampling outside the WCF
- complete sampling of Eastern Drainage Channel in WCF

Equipment in use:

- LV
- IP
- YSI
- Monsoon Pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Arrived onsite at 7:00
- Sampled Barry Cooper's bore at 8:00
- Sampled bores outside of WCF until 12:00
- Sampled ~~Bar~~ sediment around eastern drainage channel and Ash dam B at ~~the~~ locations designated by the client
- Left site at ~~15:15~~ 16:00

Completed weed and seed washdown at 15:30

Paul Papworth

DAILY LOG

DATE:	12/12/23
TIME START:	7:00
TIME END:	~~17:00~~ 16:30

Project No: BC200153.03 + BCL230169.01

Recorded By: DP

Project/Site: Callide Dilly ~~Sampling~~ Monitoring + Callide Asbestos Sampling

Other Field Staff: DL

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Sample soil at 124 Linkes Rd
- Sample Landowner bores C078-B01 / B02 (BC200153.02)
- Sample Bores on Matt Brandt's property
- complete inductions for Enviropacific (BCL230169.01)

Equipment in use:

- LV
- IP
- YSI
- Monsoon Pump

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Arrived onsite at 7:00
- Sampled bores at Matt Brandt's property until 10:30
- Completed soil sampling at 124 Linkes Rd at 12:00
- Packed up sampling equipment and began writing COCs for samples
- Sampled LOT8-BD1 BD2 at 16:00
- Finished works at 16:30

Daniel Pomeroy

- completed inductions for Enviropacific, asbestos sampling completed on 13/12/23 (BCL230169.01)

DAILY LOG

DATE:	14/12/23
TIME START:	9:00
TIME END:	20:00

Project No: BE200153.03

Recorded By: DP

Project/Site: CS Energy Quarterly Monitoring

Other Field Staff:

Project Manager: Luke Amies

Contractors:

PRE START

Planned tasks for the Day:

- Finish organising samples / COC
- Demobilise from site

Equipment in use:

- LV

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	
TIME START:	
TIME END:	

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.): See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- Arrived on site at 9:00
- Organised samples / COCs
- Left site at 12:30
- Delivered samples to ALS at 3:30pm
- Arrived in Brisbane at 8:00pm

Daniel Raymond

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW56
Job No:	BC200153.03	**Date:**	5/12/2023 10:16
Recorded By:	Dan P	**Lat / Long:**	-24.36303,150.60032
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	
Well Head Condition		Screen interval - Bottom (m BTOC)	

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)		Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
5/12	10:17	10			7.31	10,085	476.3	4.68	63.1				29.5	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW56			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW81
Job No:	BC200153.03	**Date:**	5/12/2023 14:06
Recorded By:	Dan P	**Lat / Long:**	-24.35748,150.61745
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	16
Well Head Condition		Screen interval - Bottom (m BTOC)	22

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	9.36	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	22.06	Well Diameter (mm)	50
Height of Standing Water Column (m)	12.7	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	133.35

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☑ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
5/12	14:08	20		9.56	7.4	6,546	11.7	0.76	9.2				24.8	Clear	None
5/12	14:39	40	0	9.6	7.35	6,544	7	1.46	17				24.7	Clear	None
5/12	14:45	60	3.333	9.6	7.12	6,553	-10	0.08	0.9				24.7	Clear	None
5/12	14:48	80	10	9.6	7.09	6,555	-5	0.17	2				24.7	Clear	None
5/12	14:48	100		9.6	7.04	6,555	-10.3	0.1	1.2				24.7	Clear	None
5/12	14:51	120	10	9.6	7	6,559	-14.6	0.07	0.9				24.7	Clear	None
6/12	07:02		0	9.6	7	6,590	-15.3	0.06	0.07				24.7	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW81			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW82
Job No:	BC200153.03	**Date:**	6/12/2023 07:31
Recorded By:	Dan P	**Lat / Long:**	-24.35786,150.61691
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	18
Well Head Condition		Screen interval - Bottom (m BTOC)	24

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	8.2	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	24.48	Well Diameter (mm)	50
Height of Standing Water Column (m)	16.28	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	170.94

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
6/12	07:32	20		9.2	7.45	9,445	-173.2	0.17	2.1				24.2	Clear	None
6/12	07:37	40	0	8.2	7.31	9,449	-166.3	0.08	1				24.2	Clear	None
6/12	07:43	60	0		7.29	9,548		0.03	0.4				24.2		
6/12	07:44	80	20		7.27	9,632	-163.3	0.07	0.9				24.2		
6/12	07:45	100			7.26	9,638	-163.5	0.06	0.7				24.2		
6/12	07:45	120			7.27	9,634	-163.7	0.05	0.6				24.2		
6/12	07:47	140	10		7.27	9,730	159.7	0.07	0.8				24.2		
6/12	07:48	160			7.26	9,724	-156.8	0.05	0.6				24.2		
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW82			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW83
Job No:	BC200153.03	**Date:**	6/12/2023 08:02
Recorded By:	Dan P	**Lat / Long:**	-24.35954,150.61449
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	17
Well Head Condition		Screen interval - Bottom (m BTOC)	23

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	6.13	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	22.7	Well Diameter (mm)	50
Height of Standing Water Column (m)	16.57	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	173.985

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☑ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
6/12	08:11	20		6.3	7.1	7,919	-69.4	0.53	5				23.2	Clear	None
6/12	08:15	30	3.333	6.3	7.06	7,911	-77	0.12	1.4				23.3	Clear	None
6/12	08:16	31	1	6.3	7.04	7,909	-78.1	0.13	1.6				23.3		
6/12	08:19	32	0	6.3	7.03	7,911	-78.5	0.13	1.5				23.4		
6/12	08:21	33	0.5	6.3	7.03	7,910	-77.6	0.08	1				23.4		
6/12	08:22	34		6.3	7.02	7,905	-77.4	0.08	1				23.4	Clear	None
Other Observations			Swapped to low flow at 30L												

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW83			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW84
Job No:	BC200153.03	**Date:**	6/12/2023 08:37
Recorded By:	Dan P	**Lat / Long:**	-24.35728,150.61818
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	12
Well Head Condition		Screen interval - Bottom (m BTOC)	18

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	6.5	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	18.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	12	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	126

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
6/12	08:45	20		6.62	6.98	5,844	-131.4	0.14	1.7				24.7	Clear	None
6/12	08:54	40	2.5	6.63	6.84	5,833	-98.7	0.06	0.8				24.7	Clear	None
6/12	08:55	60		6.63	6.8	5,827	-101.7	0.03	0.4				24.7		
6/12	09:02	60	0		6.78	5,815	-95	0.01	0.1				24.7		
6/12	09:02				6.75	5,815	-85						24.7		
6/12	09:03	100			6.73	5,820	-83.2	0.12	1.2				24.7		
6/12	09:04	120	0	6.63	6.72	5,814	-85.7	0.02	0.2				24.7	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW84			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW85
Job No:	BC200153.03	**Date:**	6/12/2023 09:19
Recorded By:	Dan P	**Lat / Long:**	-24.36047,150.61491
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	
Well Head Condition		Screen interval - Bottom (m BTOC)	15.5

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	6.32	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	13.51	Well Diameter (mm)	50
Height of Standing Water Column (m)	7.19	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	75.495

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
6/12	09:30	10		6.7	11.99	9,442	-117	1.21	15				24.6	Clear	None
6/12	09:31	11		6.74	11.92	9,445	-108.8	1.24	15.1				25	Clear	None
6/12	09:34	12	0.5	6.75	12.16	9,463	-114.7	1.08	13.6				25.1	Clear	None
6/12	09:35	13	1	6.76	12.18	9,473	-113.1	1.11	13.9				25.2		
6/12	09:37	14	1	6.78	12.19	9,475	-112.2	1.11	13.7				25.1		
6/12	09:39	15	0	6.8	12.21	9,476	-105.6	1.58	19.5				25.1	Clear	None
6/12	09:40	16		6.81	12.21	9,471	-106.2	1.33	16.5				25.2	Clear	None
6/12	09:41	17	0	6.83	12.21	9,475	-106.2	1.18	14.7				25.3	Clear	None
Other Observations		Swapped to low flow at 10L													

WELL SAMPLING

Sampling Method				
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW85			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW94
Job No:	BC200153.03	**Date:**	6/12/2023 10:03
Recorded By:	Dan P	**Lat / Long:**	-24.36192,150.61241
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	19
Well Head Condition		Screen interval - Bottom (m BTOC)	25

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	11	Pump Intake Depth (mBTOC)	22
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	24.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	14	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	147

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
6/12	10:04	20		11	8.24	10,678	-13.5	0.08	1				24.7	Clear	None
6/12	10:09	40	0	11	7.99	10,674	-17.9	0.05	0.7				24.7	Clear	None
6/12	10:20	60	1.818	11	7.7	10,666	-28.4	0.03	0.4				24.7	Clear	None
6/12	10:20	80		11	7.61	10,669	-16.1	0.04	0.5				24.8	Clear	None
6/12	10:27	100	3.333	11	7.59	10,659	-18	0.08	0.9				24.7	Clear	None
6/12	10:33	120	4	11	7.48	10,649	-22.6	0.03	0.4				24.8	Clear	None
6/12	10:34	140	20	11	7.45	10,646	-34.2						24.8		
6/12	10:36	150	0		7.43	10,644	-27.9						24.7		
6/12	10:39	160	5	11	7.43	10,642	-30.7	0	0				24.7	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW94			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW78
Job No:	BC200153.03	**Date:**	6/12/2023 10:55
Recorded By:	Dan P	**Lat / Long:**	-24.36192,150.61246
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	14
Well Head Condition		Screen interval - Bottom (m BTOC)	23

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	10.65	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	23.5	Well Diameter (mm)	100
Height of Standing Water Column (m)	12.85	Well Annulus (mm)	150
Discharge Water Disposal Method		Minimum Purge Volume	250.575

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☑ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
6/12	10:58	60		10.65	7.41	10,630	-15.4	0.16	1.8				24.6	Clear	None
6/12	11:05	120	8.571	10.65	7.5	10,634	7.9	0.35	4.6				24.5		
6/12	11:10	180	15	10.65	7.39	10,635	6.5	0.73	8.2				24.5	Clear	None
6/12	11:11	200	20	10.65	7.34	10,622	-11.8	0.04	0.4				24.7	Clear	None
6/12	11:14	220	10		7.3	10,633	-14	0.04	0.4				24.8		
6/12	11:17	240	0		7.29	10,622	-20.2	0.02	0.3				24.8	Clear	None
6/12	11:18	260		10.65	7.29	10,622	-22.2	0.3	0.03				24.7	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW78			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW49
Job No:	BC200153.03	**Date:**	6/12/2023 11:37
Recorded By:	Dan P	**Lat / Long:**	-24.36278,150.60273
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	12
Well Head Condition		Screen interval - Bottom (m BTOC)	18

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	9.7	Pump Intake Depth (mBTOC)	16
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	18	Well Diameter (mm)	50
Height of Standing Water Column (m)	8.3	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	87.15

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☑ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
6/12	11:38	0			7.16	13,095	-50.5	0.72	8.2				28.1	Clear	
Other Observations															

WELL SAMPLING

Sampling Method	OtherHydrasleeve			
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW49			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW40
Job No:	BC200153.03	**Date:**	6/12/2023 13:15
Recorded By:	Dan P	**Lat / Long:**	-24.36101,150.60262
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	12.2
Well Head Condition		Screen interval - Bottom (m BTOC)	18.2

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	6.03	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	18.2	Well Diameter (mm)	50
Height of Standing Water Column (m)	12.17	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	127.785

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☑ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
6/12	13:22	0			7.12	8,392	11.9	2.02	25.9				26.8	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method	Bailer			
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW40			RB01_0612 (Dip Tape)
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	ESC3
Job No:	BC200153.03	**Date:**	6/12/2023 13:45
Recorded By:	Dan P	**Lat / Long:**	-24.361,150.61397
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	17.4
Well Head Condition		Screen interval - Bottom (m BTOC)	20.4

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	14.36	Pump Intake Depth (mBTOC)	19
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	23.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	9.14	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	95.97

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
6/12	13:55	20		14.36	7.14	9,446	10.3	0.09	1.1				24	Clear	None
6/12	13:57	40	10	14.36	7.15	9,447	8.9	0.14	1.7				24	Clear	None
6/12	14:00	60	10	14.36	7.12	9,447	3.8	0.04	0.4				24	Clear	None
6/12	14:03	80	10		7.11	9,441	3.6	0.03	0.3				24	Clear	None
6/12	14:03	100		14.36	7.11	9,440	0.5	0.01	0.1				24	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	ESC3			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW74
Job No:	BC200153.03	**Date:**	7/12/2023 07:44
Recorded By:	Dan P	**Lat / Long:**	-24.33337,150.61488
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	17
Well Head Condition		Screen interval - Bottom (m BTOC)	26

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	12.47	Pump Intake Depth (mBTOC)	20
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☑ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
7/12	07:44	0			7.49	4,039	-58.3	1.53	18.3				24.2	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method	OtherHydrasleeve			
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW74			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW59
Job No:	BC200153.03	**Date:**	7/12/2023 08:08
Recorded By:	Dan P	**Lat / Long:**	-24.35388,150.59812
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	
Well Head Condition		Screen interval - Bottom (m BTOC)	

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	5.76	Pump Intake Depth (mBTOC)	7
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
7/12	08:09	0			7.68	10,561	-12.4	3.14	38.9				25.3	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method	OtherHydrasleeve			
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW59			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW98
Job No:	BC200153.03	**Date:**	7/12/2023 08:20
Recorded By:	Dan P	**Lat / Long:**	-24.36294,150.60285
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	12
Well Head Condition		Screen interval - Bottom (m BTOC)	18

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)		Pump Intake Depth (mBTOC)	16
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
7/12	08:33	1		11	7.74	7,498	-66.4	1.77	21.8				25	Cloudy	None
7/12	08:37	3	0.5	11.2	7.7	7,513	-53	1.97	24.9				26.3	Cloudy	
7/12	08:44	4	0.167	11.4	7.65	7,554	-46.3	2.2	27.8				26.3	Clear	
7/12	08:47	4	0	11.45	7.62	7,491	-49.9	1.69	21.5				26.1	Clear	None
7/12	08:47	5		11.5	7.61	7,488	-48.8	1.65	20.9				26.1	Clear	None
7/12	08:48	6	1	11.54	7.61	7,511	-42.1	1.66	21.1				26.4	Clear	None
7/12	08:51	7	0	11.57	7.61	7,505	-40.2	1.67	21.2				26.4	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW98			RB01-0712 (Pump)
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW42
Job No:	BC200153.03	**Date:**	7/12/2023 09:12
Recorded By:	Dan P	**Lat / Long:**	-24.36142,150.61355
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	19.2
Well Head Condition		Screen interval - Bottom (m BTOC)	25.2

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	12.69	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	25.2	Well Diameter (mm)	50
Height of Standing Water Column (m)	12.51	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	131.355

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
7/12	09:18	20		12.7	7.36	9,942	-38.5	1.68	20.9				25	Pink	None
7/12	09:27	40	2.222	12.7	7.13	10,057	-31.9	0.27	30				25	Clear	None
7/12	09:28	60			7.11	10,062	-36.1	0.23	2.8				25	Clear	None
7/12	09:32	80	6.667	12.7	7.07	10,066	-38.7	0.2	2.4				25	Clear	None
7/12	09:33	100	20		7.05	10,068	-40.5	0.17	2.1				25	Clear	None
7/12	09:37	120	6.667		7	10,087	-39.7	0.14	1.8				25.9	Clear	None
7/12	09:41	130	0		7	10,094	-40.5	0.1	1.3				25		
7/12	09:42	140		12.7	6.99	10,094	-42.1	0.09	1.1				25	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW42			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	ESC4
Job No:	BC200153.03	**Date:**	7/12/2023 09:58
Recorded By:	Dan P	**Lat / Long:**	-24.36019,150.61527
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	9.5
Well Head Condition		Screen interval - Bottom (m BTOC)	18.5

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	7.26	Pump Intake Depth (mBTOC)	14
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
7/12	10:26	0			7.6	9,284	-21.5	1.02	13.7				31.7	Cloudy	None
Other Observations															

WELL SAMPLING

Sampling Method	OtherHydrasleeve			
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	ESC4			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment	pH was taking long time to stabilise on YSI, was calibrated properly though			

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW90
Job No:	BC200153.03	**Date:**	7/12/2023 11:02
Recorded By:	Dan P	**Lat / Long:**	-24.36193,150.61459
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	21
Well Head Condition		Screen interval - Bottom (m BTOC)	27

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	9.5	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	27.6	Well Diameter (mm)	100
Height of Standing Water Column (m)	18.1	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	352.95

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
7/12	11:14	20		9.91	5.45	8,110	51.9	0.68	7.8				24.6	Clear	None
7/12	11:25	40	2	10.32	4.77	8,111	74.5	0.04	0.5				24.7	Clear	None
7/12	11:35	80	4	10.36	6.93	8,139	-49.9	0.05	0.5				24.6	Clear	None
7/12	11:36	100			6.93	8,143	-50.6	0.04	0.4				24.7	Clear	None
7/12	11:45	120	2.222		6.9	8,142	-44.7						24.7		
7/12	11:46	140			6.9	8,140	-44.7						24.5		
7/12	11:47	160		10.4	6.89	8,147	-42.3	0.04	0.4				24.5		
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW90			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW09
Job No:	BC200153.03	**Date:**	7/12/2023 13:07
Recorded By:	Dan P	**Lat / Long:**	-24.36245,150.60882
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	7
Well Head Condition		Screen interval - Bottom (m BTOC)	

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	7.38	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	10.18	Well Diameter (mm)	50
Height of Standing Water Column (m)	2.8	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	29.4

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
7/12	13:21	2		7.87	7.19	10,987	-0.1						25.6	Grey	None
7/12	13:22	4		7.88	7.21	10,944	-0.5	1.81	20.9				25.2		
7/12	13:24	6	0	7.89	7.15	10,998	-1.7	1.34	15.1				25.1	Clear	None
7/12	13:28	7	0.25		7.2	10,990	12	1.89	24.9				25.8	Clear	None
7/12	13:31	8	0.5		6.7	10,978	17.4	1.52	18.9				25.9	Clear	None
7/12	13:34	9	0		6.57	10,990	27.2	1.33	16.5				25.6	Clear	None
7/12	13:34	10			6.34	10,997	38.4	1.24	13.6				25.4	Clear	None
7/12	13:37	12	1		5.85	11,037	53.5	0.53	6.7				25.7		
7/12	13:42	13	0		5.71	11,014	61	0.79	10				25.6	Clear	None
7/12	13:44	14	0		5.57	11,066	68.9						25.8		
7/12	13:49	15	0.2		5.39	10,969	74.5								
7/12	13:49	16			5.38	11,034	79.6								
7/12	13:51	16.5	0		5.37	11,026	79.8	0.7	8.8				26	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW09			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW43
Job No:	BC200153.03	**Date:**	8/12/2023 07:26
Recorded By:	Dan P	**Lat / Long:**	-24.36163,150.61478
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	24.4
Well Head Condition		Screen interval - Bottom (m BTOC)	30.4

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	11.36	Pump Intake Depth (mBTOC)	28
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
8/12	07:39	2		11.67	7.22	7,071	-193	1.2	14.7				25.2	Pink	H2S
8/12	07:40	4		11.79	6.74	7,062	-155.7	0.94	11.8				24.8	Pink	None
8/12	07:47	6	0.286	11.8	7.03	7,136	-164.6	1.07	13.3				26.3	Clearing	None
8/12	07:50	8	1	11.84	6.9	7,154	-162.3	0.8	9.9				26.3	Clear	None
8/12	07:54	9	0	11.85	6.89	7,152	-164.3						26.3	Clear	None
8/12	07:54	10		11.87	6.89	7,154	-163.3	0.7	8.9				26.3	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW43			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW89
Job No:	BC200153.03	**Date:**	8/12/2023 08:03
Recorded By:	Dan P	**Lat / Long:**	-24.36177,150.6147
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	5
Well Head Condition		Screen interval - Bottom (m BTOC)	11

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	10.56	Pump Intake Depth (mBTOC)	11
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	12.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	1.94	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	20.37

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☑ Yes	At 10 L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
8/12	08:17	10		10.6	7.03	7,063	-16.6	1.61	20.2				26.9	Pink	Mild H2S

Other Observations	Purged dry on 7/12/23, sampled 8/12/23

WELL SAMPLING

Sampling Method				
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW89			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW91
Job No:	BC200153.03	**Date:**	8/12/2023 08:20
Recorded By:	Dan P	**Lat / Long:**	-24.36201,150.61538
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	12.1
Well Head Condition		Screen interval - Bottom (m BTOC)	18.1

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	12.22	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	18.8	Well Diameter (mm)	50
Height of Standing Water Column (m)	6.58	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	69.09

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
8/12	08:52	20		12.21	6.91	2,995	-36.7	0.31	4.3				25.1	Clear	None
8/12	09:00	40	0		6.9	3,023	-37.6								
8/12	09:00	60			6.9	3,033	-37.6	0.89	9.2				25.1	Clear	
8/12	09:02	80	10	12.25	6.9	3,015	-37.9	0.37	4.3				25	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW91			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW32
Job No:	BC200153.03	**Date:**	8/12/2023 09:15
Recorded By:	Dan P	**Lat / Long:**	-24.36026,150.61698
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	22
Well Head Condition		Screen interval - Bottom (m BTOC)	25

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	16.9	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	25.7	Well Diameter (mm)	50
Height of Standing Water Column (m)	8.8	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	92.4

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
8/12	09:30	4			6.89	6,475	-143.2	0.78	10.1				27.8	Clear	Mild H2S
8/12	09:33	5	0.5		6.66	6,368	-106.8						26.7	Clear	None
8/12	09:36	6	0		6.65	6,502	-93.8						26.7	Clear	None
8/12	09:37	7		16.9	6.55	6,502	-84.2	0.6	6.4				26.7		
8/12	09:43	8	0	16.9	6.54	6,452	-80.2	0.46	6				27.9		
8/12	09:44	9		16.9	6.54	6,457	-79.5	0.48	6.4				28	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW32			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW31
Job No:	BC200153.03	**Date:**	8/12/2023 10:14
Recorded By:	Dan P	**Lat / Long:**	-24.36296,150.61728
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	11
Well Head Condition		Screen interval - Bottom (m BTOC)	14

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	6.7	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	13	Well Diameter (mm)	50
Height of Standing Water Column (m)	6.3	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	66.15

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☑ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
8/12	10:33	10		7.4	6.86	4,836	-164.3	1.23	11.3				25.8	Clear	None
8/12	10:35		0	7.41	6.88	4,797	-147.5	0.24	3				25.8	Clear	None
8/12	10:42	12	1.714		6.89	4,769	-151.4						25.7		
8/12	10:45	13	0		6.9	4,762	-151.4	0	0				25.7	Clear	None
8/12	10:46	14		7.41	6.9	4,756	-152.2	0	0				25.7	Clear	None
Other Observations			Swapped to low flow at 10L												

WELL SAMPLING

Sampling Method				
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW31	BD01_0812	BD01_0812	
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	L006-B05
Job No:	BC200153.03	**Date:**	8/12/2023 12:19
Recorded By:	Dan P	**Lat / Long:**	-24.36373,150.57351
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type	Extraction	Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	
Well Head Condition		Screen interval - Bottom (m BTOC)	

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)		Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method	Ground Surface	Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☑ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
8/12	12:20	20			6.68	3,093	46.8	3.63	47.7				29	Cloudy	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	L006-B05	BD02_0812	BD02_0812	
Analysis/Bottles	☐ Metals (Filtered) ☐ Metals (Unfiltered) ☐ General Water Quality (Unpreserved) ☐ Organics (Unpreserved Amber) ☐ VOCs (Vial) ☐ Nutrients ☐ PFAS ☐ Microbiology ☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**
Other photos:	

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	L021-B01
Job No:	BC200153.03	**Date:**	8/12/2023 13:49
Recorded By:	Dan P	**Lat / Long:**	-24.36298,150.55514
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	
Well Head Condition		Screen interval - Bottom (m BTOC)	

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)		Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
8/12	13:49	20			7.43	724	17.3	2.76	36.2				31.3	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	L021-B01			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	RN13030692
Job No:	BC200153.03	**Date:**	8/12/2023 13:58
Recorded By:	Dan P	**Lat / Long:**	-24.37201,150.55285
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	9.7
Well Head Condition		Screen interval - Bottom (m BTOC)	16.7

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	11	Pump Intake Depth (mBTOC)	16
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	17.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	6.5	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	68.25

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
8/12	14:08	20		11	7.02	616	37	2.56	31.1				24.7	Clear	None
8/12	14:08	40		11	6.94	516	33.1	2.54	30.3				24.7	Clear	None
8/12	14:14	60	0	11	6.93	516	31.7						24.7	Clear	None
8/12	14:14	70		11	6.92	515	31.3	2.46	29.6				24.7	Clear	None

Other Observations

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	RN13030692			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	RN13030698
Job No:	BC200153.03	**Date:**	9/12/2023 07:26
Recorded By:	Dan P	**Lat / Long:**	-24.36687,150.49936
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	17.2
Well Head Condition		Screen interval - Bottom (m BTOC)	18.2

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	9.18	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	19	Well Diameter (mm)	50
Height of Standing Water Column (m)	9.82	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	103.11

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
9/12	07:37	20			6.54	2,651	29.7	1.48	17.6				23.9	Clear	None
9/12	07:44	40	2.857		6.99	2,656	-5.6	1.29	15.4				23.9	Clear	None
9/12	07:46	60	20		6.8	2,661	-4.6						23.9	Clear	Nonw
9/12	07:47	80	20		6.66	2,661	0.7	1.2	14.3				23.9	Clear	None
9/12	07:50	100	10	9.18	6.76	2,666	-1	1.2	14.3				23.9	Clear	None
9/12	07:55	110	2		6.76	2,664	-3.5	1.33	14.7				23.9		
9/12	07:55	120			6.75	2,664	-5.4	1.2	14.6				23.9	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	RN13030698			RB01_0912 (Pump)
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	RN13030715
Job No:	BC200153.03	**Date:**	9/12/2023 08:07
Recorded By:		**Lat / Long:**	-24.35291,150.49684
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	11
Well Head Condition		Screen interval - Bottom (m BTOC)	18

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	10.14	Pump Intake Depth (mBTOC)	13
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	14.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	4.36	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	45.78

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
9/12	08:23	20			6.99	2,894	19	5.7	68.6				24	Clear	None
9/12	08:26	40	0		7.03	2,897	20.1	5.72	69.3				23.9	Clear	None
9/12	08:27	50	10		7.03	2,897	19.9	5.77	69.3				23.9	Clear	None
9/12	08:28	60			7.03	2,897	21.4	5.71	68.2				23.9	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	RN13030715	BD03_0912	BD03_0912	
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	RN13030697
Job No:	BC200153.03	**Date:**	9/12/2023 08:59
Recorded By:	Dan P	**Lat / Long:**	-24.36252,150.53386
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	12.7
Well Head Condition		Screen interval - Bottom (m BTOC)	13.7

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	10.7	Pump Intake Depth (mBTOC)	13.4
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	13.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	2.8	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	29.4

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☑ Yes	At 5 L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
9/12	09:00	5		11	7.08	1,251	-89.7	0.62					30.8	Grey	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☑ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	RN13030697			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**
Other photos:	

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	RN13030126
Job No:	BC200153.03	**Date:**	9/12/2023 09:25
Recorded By:	Dan P	**Lat / Long:**	-24.37626,150.53154
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	19.2
Well Head Condition		Screen interval - Bottom (m BTOC)	21.6

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	11.35	Pump Intake Depth (mBTOC)	18.6
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	19	Well Diameter (mm)	50
Height of Standing Water Column (m)	7.65	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	80.325

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
9/12	09:38	20			7.1	612	-33.9	0.16	1.9				24.6	Clear	None
9/12	09:44	40	4		6.92	611	-17.7	0.11	1.3				24.6	Clear	None
9/12	09:48	60	6.667		6.87	611	-20	0.13	1.5				24.6		
9/12	09:53	80	4	11.35	6.81	614	-24.5	0.03	0.4				24.6	Clear	None
9/12	09:54	90	10		6.8	614	-26.7	0.02	0.3				24.6	Clear	None
9/12	09:54	100		11.35	6.8	614	-28.1	0.02	0.2				24.6	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	RN13030126			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW73
Job No:	BC200153.03	**Date:**	9/12/2023 10:09
Recorded By:	Dan P	**Lat / Long:**	-24.37837,150.56205
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	10
Well Head Condition		Screen interval - Bottom (m BTOC)	19

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	13.02	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	17.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	4.48	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	47.04

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
9/12	10:24	20		13.02	6.37	2,451	-14.4	0.13	1.6				24.5	Clear	None
9/12	10:28	40	5		6.37	2,447	-17	0.14	1.2				24.6		
9/12	10:29	50		13.02	6.37	2,443	-19.3	0.06	0.8				24.6	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW73			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW97
Job No:	BC200153.03	**Date:**	10/12/2023 09:48
Recorded By:	Dan P	**Lat / Long:**	-24.40531,150.5021
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	2.5
Well Head Condition		Screen interval - Bottom (m BTOC)	4

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)		Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	4	Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☑ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
10/12	09:58														
Other Observations			Dry												

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☑ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	L012-B01
Job No:	BC200153.03	**Date:**	11/12/2023 07:53
Recorded By:	Dan P	**Lat / Long:**	-24.38167,150.55181
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	
Well Head Condition		Screen interval - Bottom (m BTOC)	

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)		Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			℃		
11/12	07:53	20			7.32	1,322	-14	1.96	23.4				24.9	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	L012-B01			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW72
Job No:	BC200153.03	**Date:**	11/12/2023 08:35
Recorded By:	Dan P	**Lat / Long:**	-24.36778,150.58437
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	8.5
Well Head Condition		Screen interval - Bottom (m BTOC)	17.5

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	14.8	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	17.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	2.7	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	28.35

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
11/12	08:53	20		14.8	6.9	762	-56.1	0.28	3.2				23	Clear	None
11/12	08:54	25			6.89	753	-56.9	0.19	2.1				23	Clear	None
11/12	08:56	30	0		6.89	753	-58.5	0.14	1.6				23	Clear	None
11/12	08:57	35			6.88	753	-59.3	0.14	1.6				23.1	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW72			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW68
Job No:	BC200153.03	**Date:**	11/12/2023 09:18
Recorded By:	Dan P	**Lat / Long:**	-24.36379,150.60018
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	9
Well Head Condition		Screen interval - Bottom (m BTOC)	18

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	10.21	Pump Intake Depth (mBTOC)	16
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	17.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	7.29	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	76.545

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
11/12	09:36	20			6.61	8,534	-43.9	0.72	8.4				23.6	Clear	None
11/12	09:43	40	2.857		6.6	8,547	-50.1	0.08	1				23.6	Clear	None
11/12	09:45	60	20		6.59	8,546	-52.1	0.07	1				23.6	Clear	None
11/12	09:45	80			6.59	8,447	-54.1	0.06	0.9				23.6	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW68	BD04_1112	BD04_1112	RB01_1112 (Pump)
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW80
Job No:	BC200153.03	**Date:**	11/12/2023 10:52
Recorded By:	Dan P	**Lat / Long:**	-24.36363,150.60695
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	4.5
Well Head Condition		Screen interval - Bottom (m BTOC)	

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	1.87	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
11/12	10:53	0		1.87	7.19	3,974	-123	0.94	11.5				25	Clear	None

Other Observations

WELL SAMPLING

Sampling Method	OtherHydrasleeve			
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW80			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area

Photo 2: Bore condition

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	L005-B01
Job No:	BC200153.03	**Date:**	12/12/2023 07:51
Recorded By:	Dan P	**Lat / Long:**	-24.37904,150.57958
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	
Well Head Condition		Screen interval - Bottom (m BTOC)	

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)		Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)		Well Diameter (mm)	50
Height of Standing Water Column (m)		Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	0

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☑ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
12/12	07:51	10			7.4	2,149	7	4.19	52.6				26.9	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	L005-B01			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW70
Job No:	BC200153.03	**Date:**	12/12/2023 08:05
Recorded By:	Dan P	**Lat / Long:**	-24.36994,150.58577
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	9.5
Well Head Condition		Screen interval - Bottom (m BTOC)	18

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	11.18	Pump Intake Depth (mBTOC)	14.5
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	15.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	4.32	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	45.36

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
12/12	08:11	20		11.2	7.2	991	-84	0.37	4.3				24	Clear	None
12/12	08:16	40	4		6.89	931	-49.6	0.17	2				24	Clear	None
12/12	08:24	60	2.857		6.69	909	-43.2	0.08	1				24	Clear	None
12/12	08:28	70	0		6.69	911	-44.1						24		
12/12	08:29	80	10		6.69	910	-43.1	0.08	1				24	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW70			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW69
Job No:	BC200153.03	**Date:**	12/12/2023 08:49
Recorded By:	Dan P	**Lat / Long:**	-24.36838,150.59592
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	8.5
Well Head Condition		Screen interval - Bottom (m BTOC)	17.5

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	13.35	Pump Intake Depth (mBTOC)	
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	16.5	Well Diameter (mm)	50
Height of Standing Water Column (m)	3.15	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	33.075

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
12/12	08:58	10			6.84	1,204	-83.2	0.35	4.2				24.5	Brown	None
12/12	09:00	20	0		6.79	1,203	-46.8	0.32	3.8				24.4	Clear	None
12/12	09:13	30	0.769		6.68	1,202	-49.4	0.02	0.2				24.4		
12/12	09:13	40			6.68	1,201	-50.1	0.01	0.1				24.4		
12/12	09:14	50	0	13.4	6.67	1,201	-52.8	0.01	0.1				24.4	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method				
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW69	BD05_1212	BD05_1212	
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:
1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5
2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:	Callide Power Station Groundwater Monitoring	**Well No:**	MW33
Job No:	BC200153.03	**Date:**	12/12/2023 09:33
Recorded By:	Dan P	**Lat / Long:**	-24.36079,150.61872
Weather:			

CONSTRUCTION INFORMATION[1]

Well Type		Well stick up (m): (above/below ground level)	
Well Material		Screen interval - Top (m BTOC)	33
Well Head Condition		Screen interval - Bottom (m BTOC)	40

WELL PURGING

Measured Levels		**Purge Method**	
LNAPL Level Depth (LL in m BTOC)		Method	
Water Level Depth (WL in m BTOC)	20.16	Pump Intake Depth (mBTOC)	36
DNAPL Level Depth (DL in m BTOC)		**Minimum Purge Volume Required**	
Total Depth of Well (TD in m BTOC)	41	Well Diameter (mm)	50
Height of Standing Water Column (m)	20.84	Well Annulus (mm)	100
Discharge Water Disposal Method		Minimum Purge Volume	218.82

FIELD PARAMETER MEASUREMENT[2]

Purged dry?	☐ Yes	At L	☐ No

Date	Time	Purged	Rate	SWL	pH	EC	ORP	DO	DO	Tur	Sal	TDS	Temp	Colour	Odour
MM/DD	HH:MM	L	L/min	mBTOC		µS/cm	mV	ppm	% Sat	NTU			°C		
12/12	09:34	0			6.34	4,351	-60.2	0.64	8.4				23.7	Clear	None
Other Observations															

WELL SAMPLING

Sampling Method	OtherHydrasleeves			
Sampled ?	☐ Yes			☐ No
Sample ID & QC Samples	Primary	Duplicate	Triplicate	Rinsate
	MW33			
Analysis/Bottles	☐ Metals (Filtered)	☐ Metals (Unfiltered)	☐ General Water Quality (Unpreserved)	☐ Organics (Unpreserved Amber)
	☐ VOCs (Vial)	☐ Nutrients	☐ PFAS	☐ Microbiology
	☐ Other:			
Comment				

PHOTOS (IF TAKEN)

Photo1: Area	**Photo 2: Bore condition**

Other photos:

Note:

1.At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

2.Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

SURFACE WATER FIELD MONITORING SHEET

Job Name:		Recorded By:	DF
Job number:	BC200153.03	Date:	

Sampling Data

	Sample ID	QAQC ID	Field Parameters (Specify Units)							
			NTU	pH	EC	°C	Redox	TDS	DO %	DO mg/L
5/12/23	SW45			9.08	1368	31.1	-38.4		57.4	4.20
"	Notch-V1			7.66	18444	29.3	-16.2		66.8	4.76
"	Notch-V2			7.83	~~8~~ 19150	30.9	-82.8		94.5	6.64
"	PW2			8.18	10578	31.4	-15.1		66.1	4.65
"	SW13			8.09	14520	31.8	4.0		75.7	5.19
"	DRD			8.42	4384	32.6	17.9		96.9	6.82
	SW22			8.81	2537	33.5	9.1		100+	8.48
	SW12			8.32	4064	33.4	20.8		97.4	6.8
8/12/23	SW41			~~7~~ 7.78	3094	34.9	19.3		67.5	4.61
11/12/23	SW20			8.41*	515	27.8	-21.8		52.4	4.11

Sample ID	Colour	Clarity	GPS Coordinates		Notes (eg, Stream flow, weather conditions, observed pollution)
			Easting	Southing	

BOREHOLE LOG AD404

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD404-0.2		0	COAL SOOT - Black, with coal fines	D	VL		0
		AD404-0.5		0.5	ASH - Grey, coarse		L		0.5
				1					1
		AD404-1.5		1.5	COAL SOOT - Black, with coal fines		VL		1.5
					ASH - Grey, coarse		L		
				2					2
				2.5					2.5
		AD404-3.0		3	PEAT - Black, with rootlets	M			3
				3.5	ASH - Grey, fine				3.5
					ASH - Grey, coarse				
	▽	AD404-4.0		4	ASH - Grey, saturated	W	VS		4
				4.5	ASH - Grey, coarse	M	L		4.5
SFA				5					5
				5.5	ASH - Grey, saturated	W	S		5.5
		AD404-6.0		6					6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
				9					9
				9.5	GRAVELLY CLAY - Grey and green, coarse gravels	M	St	BD01_3005/SD01_3005 taken at 10.0 mbgl	9.5
		AD404-10.0		10					10
					EOH @ 10.0 mbgl - Target Depth				
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD405

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD405-0.2		0	COAL SOOT - Black, with coal fines	D	VL		0
		AD405-0.5		0.5	ASH - Grey, coarse		L		0.5
				1					1
		AD405-1.5		1.5	COAL SOOT - Black, with coal fines		VL		1.5
				2	ASH - Grey, coarse, trace brown gravel (med-coarse)	M	L		2
				2.5	PEAT - Black, with rootlets (5%)				2.5
		AD405-3.0		3					3
				3.5	ASH - Grey, coarse				3.5
	▽	AD405-4.0		4					4
				4.5	ASH - Grey, saturated	W	S		4.5
SFA				5	ASH - Grey, coarse		L		5
				5.5					5.5
		AD405-6.0		6					6
				6.5					6.5
				7	ASH - Grey, saturated		S		7
				7.5					7.5
				8					8
				8.5					8.5
		AD405-9.0		9					9
				9.5	CLAY - Brown, low to medium plasticity	M	St		9.5
				10					10
				10.5	EOH @ 10.0 mbgl - Target depth				10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD406

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 9 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD406-0.2		0	ASH - Grey, fine	D	VL		0
		AD406-0.5		0.5					0.5
		AD406-1.0		1					1
				1.5					1.5
		AD406-2.0		2					2
				2.5					2.5
		AD406-3.0		3					3
				3.5					3.5
				4					4
	▽	AD406-4.5		4.5	ASH - Grey, coarse	W	L		4.5
SFA		AD406-5.0		5					5
				5.5					5.5
		AD406-6.0		6					6
				6.5					6.5
		AD406-7.0		7					7
				7.5					7.5
		AD406-8.0		8	ASH - Grey, clayey, saturated		VS		8
				8.5	CLAY - Brown, medium plasticity		S		8.5
				9	EOH @ 9.0 mbgl - Target depth				9
				9.5					9.5
				10					10
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD407

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD407-0.2		0	ASH - Grey, fine	D	VL		0
		AD407-0.5		0.5					0.5
		AD407-1.0		1					1
				1.5					1.5
		AD407-2.0		2					2
				2.5					2.5
		AD407-3.0		3	ASH - Grey, fine, clayey		L		3
				3.5	ASH - Grey, coarse	M			3.5
		AD407-4.0		4					4
				4.5					4.5
SFA				5					5
				5.5					5.5
		AD407-6.0		6					6
				6.5					6.5
				7					7
				7.5					7.5
		AD407-8.0		8					8
				8.5	CLAY - Grey and brown, soft to stiff, medium plasticity		St		8.5
		AD407-9.0		9					9
				9.5					9.5
				10					10
				10.5	EOH @ 10.0 mbgl - Target depth				10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD408

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD408-0.2		0	ASH - Grey, coarse, with medium to coarse subrounded gravels	D	L		0
		AD408-0.5		0.5	ASH - Grey, coarse				0.5
				1					1
				1.5					1.5
		AD408-2.0		2	ASH - Grey		VL		2
		AD408-2.7		2.5					2.5
				3	COAL SOOT - Black		L		3
				3.5	ASH - Grey, coarse, with medium to coarse subrounded gravels				3.5
		AD408-4.0		4	COAL SOOT - Black				4
				4.5	ASH - Grey, coarse	M			4.5
SFA				5					5
				5.5					5.5
		AD408-6.0		6					6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
	▽			9	CLAY - Brown, with fine gravels, medium plasticity	W	S		9
				9.5					9.5
		AD408-10.0		10					10
				10.5	EOH @ 10.0 mbgl - Target depth				10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD409

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 4.8 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD409-0.5		0.5	ROAD BASE - Gravelly Sand	D	L		0.5
		AD409-1.1		1	ASH - Grey, coarse				1
				1.5	ASH - Grey, fine, clayey				1.5
	▽	AD409-2.0		2	GRAVELLY SAND - Brown and black, with medium to coarse gravels				2
				2.5	ASH - Grey, fine, clayey	W	S		2.5
		AD409-3.0		3		D	L		3
		AD409-3.5		3.5		W	S		3.5
				4	SILTY CLAY - Grey, high plasticity	M		Natural at 3.4 mbgl	4
				4.5	GRAVELLY CLAY - Green and grey, fine to medium gravels				4.5
				5	EOH @ 4.8 mbgl - Target Depth				5
				5.5					5.5
				6					6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
				9					9
				9.5					9.5
				10					10
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD410

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 6 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD410-0.5		0.5	ROAD BASE - Black, gravelly sand	D	L		0.5
					ASH - Grey, coarse				
		AD410-1.0		1					1
				1.5	COAL SOOT - Black				1.5
					ASH - Grey, fine, clayey				
		AD410-2.0		2	ASH - Dark Grey, fine, clayey				2
				2.5	COAL SOOT - Black		VL		2.5
	▽	AD410-3.1		3	ASH - Grey, fine	W	L		3
				3.5	ASH - Grey, coarse	D M			3.5
		AD410-4.0		4		W	S		4
				4.5					4.5
SFA				5					5
				5.5					5.5
		AD410-6.0		6					6
				6	EOH @ 6.0 mbgl - Refusal on rock				6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
				9					9
				9.5					9.5
				10					10
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD411

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 8 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD411-0.5		0.5	ASH - Grey, coarse, with medium to coarse gravels	D	L	coarse gravel to cobbles at 0.0 - 0.1 mbgl	0.5
		AD411-1.0		1				BD03_3105/SD03_3105 taken at 1.0 mbgl	1
				1.5					1.5
				2					2
				2.5	Same as above, but a darker grey with fewer gravels				2.5
		AD411-3.0		3	ASH - Grey, fine		VL		3
				3.5					3.5
				4	ASH - Grey, coarse with fine gravels		L		4
				4.5					4.5
SFA				5					5
				5.5	ASH - Grey, fine, clayey		MD		5.5
				6					6
				6.5					6.5
		AD411-7.0		7					7
				7.5					7.5
				8					8
				8.5	EOH @ 8.0 mbgl - Refusal on rock				8.5
				9					9
				9.5					9.5
				10					10
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD412

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 4.8 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD412-0.5		0.5	ROAD BASE	D	L		0.5
					COAL SOOT - Black				
		AD412-1.0		1	ASH - Grey, fine				1
					FILL - Gravelly clay, brown		St		
				1.5	COAL SOOT - Black		L		1.5
		AD412-2.0		2	FILL - Gravelly clay, light brown, fine to medium gravel		S		2
				2.5			St		2.5
		AD412-3.0		3	COAL SOOT - Black		L		3
					FILL - Gravelly clay, light brown		St		
				3.5					3.5
				4	GRAVELLY CLAY - Green and brown, medium to coarse gravels, low to medium plasticity				4
				4.5					4.5
				5	EOH @ 4.8 mbgl - Target depth				5
				5.5					5.5
				6					6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
				9					9
				9.5					9.5
				10					10
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

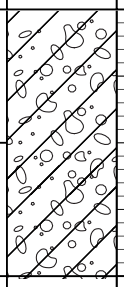
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BOREHOLE LOG AD413

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 0.2 mbgl
DIAMETER:
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
		AD413-0.2		0.05 0.1 0.15 0.2	GRAVELLY CLAY - Brown, fine to coarse gravel, with rootlets (5%), non plastic	D	St	Sample collected with shovel, inaccessible with drill rig	0.05 0.1 0.15 0.2
				0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85 0.9 0.95	EOH @ 0.2 mbgl - Surface sample				0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85 0.9 0.95

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD414

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD414-0.2		0	ASH - Grey, coarse, trace brown gravel (fine to medium)	D	L	The trace gravel is highly porous rock	0
		AD414-0.5		0.5					0.5
				1					1
				1.5	COAL SOOT - Black				1.5
		AD414-2.0		2	ASH - Grey, coarse			BD02_3005/SD02_3005 taken here	2
				2.5					2.5
				3					3
				3.5					3.5
	▽			4	PEAT - Black, trace rootlets	M			4
		AD414-4.5		4.5	ASH - Grey, coarse	W			4.5
SFA				5					5
				5.5	ASH - Grey, fine				5.5
		AD414-6.0		6					6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
				9					9
				9.5					9.5
		AD414-10.0		10					10
				10.5	EOH @ 10.0 mbgl - Target depth				10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD415

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD415-0.2		0	ASH - Grey, fine	D	VL		0
				0.5					0.5
		AD415-1.0		1					1
				1.5					1.5
		AD415-2.0		2					2
				2.5	ASH - Grey, fine, clayey	M	MD		2.5
		AD415-3.0		3					3
				3.5	ASH - Grey, fine		VL		3.5
	▽			4					4
		AD415-4.5		4.5	ASH - Grey, fine, saturated	W	VS		4.5
SFA				5	ASH - Black and grey, coarse		L		5
				5.5					5.5
		AD415-6.0		6					6
				6.5					6.5
				7					7
				7.5					7.5
		AD415-8.0		8					8
				8.5					8.5
				9					9
				9.5					9.5
				10					10
				10.5	EOH @ 10.0 mbgl - Target depth				10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

DAILY LOG

DATE:	**29/05/2023**
TIME START:	**12:00**
TIME END:	**17:00**

Project No: BC200153.03

Project Manager: MCK

Site: Callide Power Plant

Recorded by: DP

Other field Staff:

Contractors: All Clear Service Location – Allen James

PRE START

Planned tasks for the Day:

Arrive on Site and Complete Service Location

Equipment in use:

LV

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			
INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE					

DATE:	**29/05/2023**
TIME START:	**12:00**
TIME END:	**17:00**

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

Arrived in Gladstone at 8:15
Arrived on site at 10:30
Service Locator arrived at 13:15, completed in-person induction
All locations cleared by 16:45, some additional areas in Callide A were cleared near MW95, MW96 and MW97 along the access tracks
Left site at 17:00

DAILY LOG

DATE:	**30/05/2023**
TIME START:	**7:00**
TIME END:	**17:00**

Project No: BC200153.03

Project Manager: MCK

Site: Callide Power Plant

Recorded by: DP

Other field Staff:

Contractors: Mike Seefeld- Soiltech

PRE START

Planned tasks for the Day:

Drill boreholes at AD4

Equipment in use:

LV

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

DATE:	**30/05/2023**
TIME START:	**7:00**
TIME END:	**17:00**

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

Arrived on Site at 7:00
Completed onboarding meeting with driller
Drilled 7 bores in AD4 to max 10m
Left site at 17:00

DAILY LOG

DATE:	**31/05/2023**
TIME START:	**7:00**
TIME END:	**16:00**

Project No: BC200153.03

Project Manager: MCK

Site: Callide Power Plant

Recorded by: DP

Other field Staff:

Contractors: Mike Seefeld- Soiltech

PRE START

Planned tasks for the Day:

Drill remaining boreholes at AD4 and drill boreholes at Callide A

Equipment in use:

LV

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

DATE:	**31/05/2023**
TIME START:	**7:00**
TIME END:	**16:00**

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- **Arrived on Site at 7:00**
- **Drilled remaining bores at AD4, could not drill AD413 due to inaccessibility, took surface sample instead. A409, AD410, and AD412 were moved to the road, since bunding around the small ash dams prevented access for the drill rig**
- **Drilled CA17, CA18, and CA19 at Callide A**
- **Left site at 16:00**

DAILY LOG

DATE:	01/06/2023
TIME START:	7:00
TIME END:	17:00

Project No: BC200153.03

Project Manager: MCK

Site: Callide Power Plant

Recorded by: DP

Other field Staff:

Contractors: Mike Seefeld- Soiltech

PRE START

Planned tasks for the Day:

Install wells in Callide A

Equipment in use:

LV

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	**01/06/2023**
TIME START:	**7:00**
TIME END:	**17:00**

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

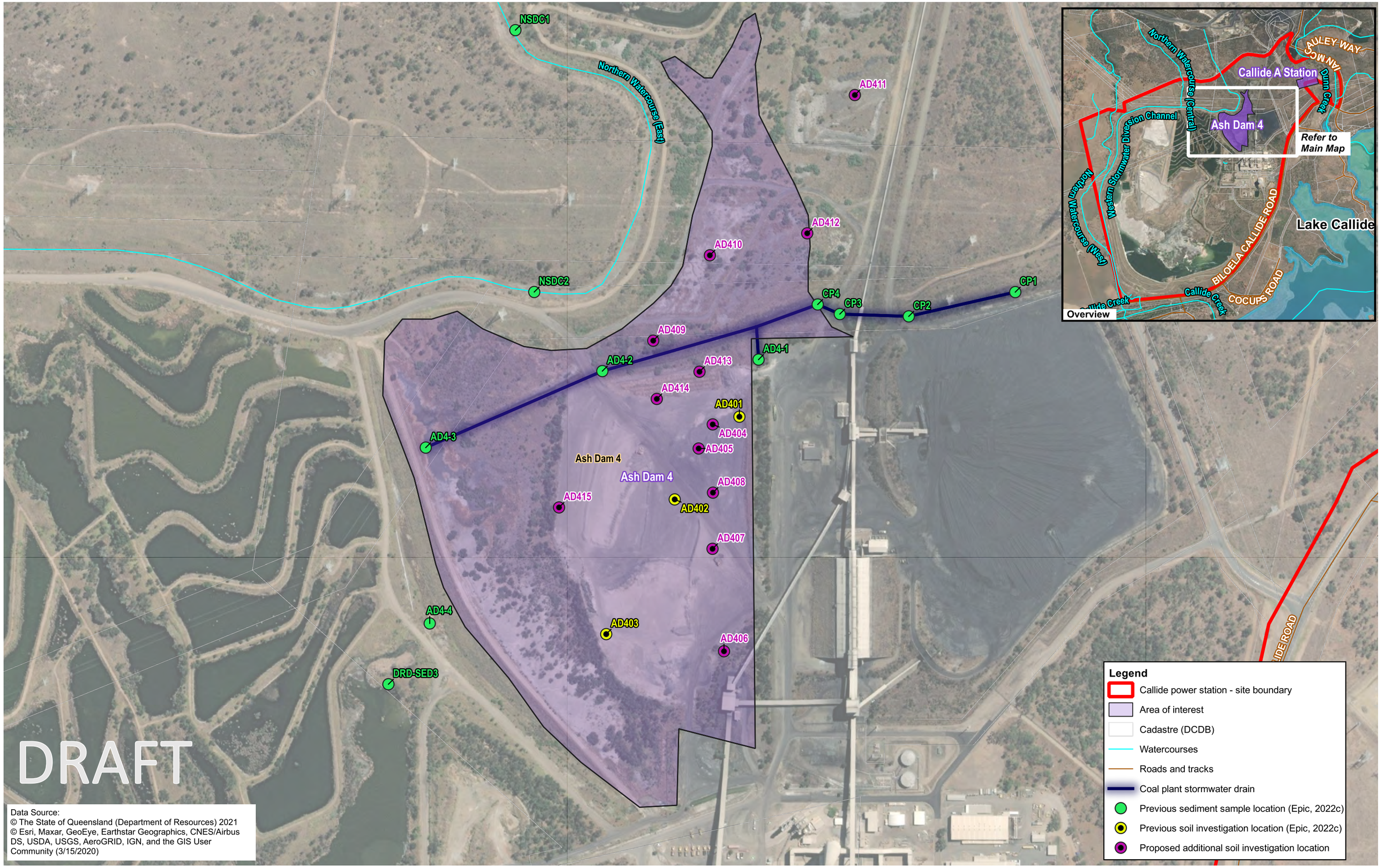
See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- **Arrived on Site at 7:00**
- **Attempted to drill MW95,constantly hit refusal in multiple boreholes (MW95, MW95#2), one borehole reached ~5m before refusal, but the conditions in the bore made well installation too difficult (very ashy and gravelly)**
- **Drilled MW97, reached 0.5m into saturated zone (3.3 mbgl total depth) before refusal, attempted to drill second borehole (MW96#2) to try to reach 6m and only got to ~1.5m before refusal. Installed well in the 3.3m deep borehole**
- **Drilled multiple boreholes for MW96 (MW96, MW96#2, and MW96#3), was hitting refusal at or before 3 mbgl. One borehole reached 6 mbgl before refusal, but no water was present. A dry well was installed at this location (MW96#3). The well was installed at the side of the access road, could not be drilled into Ash Dam 2 as this area was not service located.**
- **Left site at 17:00**



©QGIS 2019 File Path: E:\GIS\Projects\2020\BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.03\Addendum Sampling and Analysis Quality Plan\Figure F2 AD4 Previous and Proposed Investigation Locations.qgz

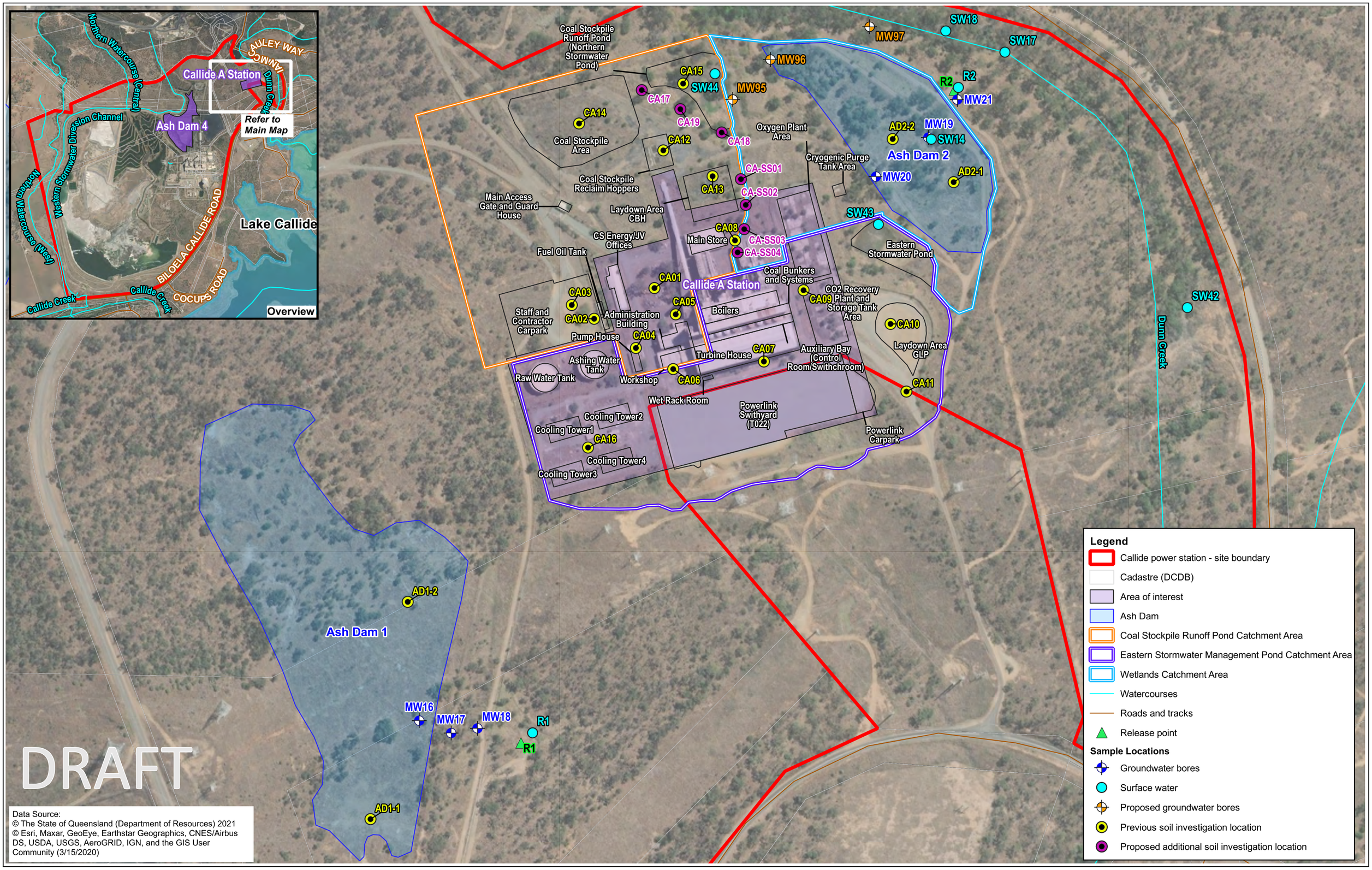
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Scale: 1: 4,000@ A3

Datum: GDA94 Projection: MGA zone 56

CS Energy
PFAS investigation (Callide Power Station)
Addendum Sampling and Analysis Quality Plan

Figure F2
AD4 Previous and Proposed Investigation Locations



©QGIS 2019 File Path: E:\GIS\Projects\2020\BC2020\BC200153.01 CS Energy CallideWorkspaces\BC200153.03\Addendum Sampling and Analysis Quality Plan\Figure F3 Callide A Previous and Proposed Investigation Locations.qgz

epic ENVIRONMENTAL

0 50 100 150 200 m

Scale: 1: 3,000@ A3

Datum: GDA94 Projection: MGA zone 56

CS Energy
PFAS investigation (Callide Power Station)
Addendum Sampling and Analysis Quality Plan

Figure F3
Callide A Previous and Proposed Investigation Locations

Powerlink Queensland
33 Harold Street,
Virginia, Qld, 4014
Phone: (07) 3866 1313
24/05/2023

To: ('Applicant')
Epic Environmental - Daniel Papinczak
124/95 Clarence Road, Indooroopilly
Brisbane QLD 4068

Email: dpapinczak@epicenvironmental.com.au **Phone:** +61439115598

Sequence No 224998129
Enquiry Location: 1092 Biloela Callide Road Mount Murchison
Enquiry Date: 24/05/2023 10:47

Dear Daniel Papinczak

Thank you for your enquiry in relation to the Enquiry Location. Queensland Electricity Transmission Corporation Limited ACN 078 849 233 trading as Powerlink Queensland ("Powerlink") respond as follows:

Powerlink's records show that there **ARE** underground cables in the Enquiry Location.

A plan is attached showing the approximate location of Powerlink's assets in the vicinity of the Enquiry Location.

Should our response identify the presence of decommissioned Powerlink assets it should be noted that damage to these assets may result in an environmental hazard . As a precaution, all underground assets should be treated as live, and all necessary precautions should be taken to ensure that the cables are not damaged. Should damage occur, all work in the area surrounding the cables must be ceased immediately and Powerlink called on 07 3266 9410 to report the damage and get further advice.

Proposed works in close proximity to Powerlink's plant must undergo a detailed assessment by Powerlink. Please allow at least four to six weeks (more in complex situations) for Powerlink to process your application.

All work in close proximity to Powerlink's cables must be supervised by a Powerlink-appointed person and can be arranged by contacting Powerlink on (07) 3866 1313 at least seven days in advance.

The attached duty of care guidelines below must be observed at all times

Yours faithfully

Narelle Titman
Manager Property
Powerlink Queensland

Powered by: dbydsuite

Before You Dig Terms and Conditions

"Duty of Care" for Everyone

Responsibilities When Working in the Vicinity of POWERLINK'S Plant

Everyone has a legal duty of care that must be observed, particularly when working in the vicinity of electrical plant. "Electrical plant" includes underground cables, conduits and other associated underground equipment. It should be noted that the placing or removal of soil by excavation, digging or by any other means is not allowed in a Powerlink-easement without prior written consent from Powerlink. In most cases it is unlikely that consent will be granted.

When discharging this duty of care in relation to Powerlink's plant, the following points must be considered:

1. It is the responsibility of the architect, consulting engineer, developer and head contractor in the project planning stages to design for minimal impact and adequate protection of Powerlink's plant. Powerlink will provide free plans showing the presence of its underground plant to assist.
2. It is the developer or constructor's responsibility to:
    - investigate whether Powerlink's plant is present in a particular location and obtain the most up to date plans available from Powerlink before commencing construction.
    - visually locate Powerlink's plant by hand digging where construction activities may be in close proximity to or interfere with Powerlink's plant.
    - contact Powerlink's Property Services & Management Team on (07) 3866 1313 if Powerlink's plant is wholly or partly affected by planned development and construction activities.
3. As the alignment and boundaries of road ways with other properties (and roads within road ways) frequently change, the alignments and boundaries contained within Powerlink's plans and maps will frequently differ from present alignments and boundaries "on the ground". Accordingly, in every case where it appears that alignments and boundaries have shifted, or new road ways have been added, the constructor should obtain confirmation of the actual position of Powerlink's plant under or along the road ways. The constructor must never rely on statements made by third parties in relation to the position of Powerlink's plant.

Important Points to Note – Please Read

• Plans and details provided by Powerlink are current for one month from the Response Date and should be disposed of by shredding or any other secure disposal method after use.

• Powerlink's plans are diagrams only. They indicate the presence of underground plant in the general vicinity of the Enquiry Location. Exact ground cover and alignments cannot be given with any certainty, as such levels can change over time.

• To avoid damage or injury, Powerlink's plant must be carefully located under the supervision of a Powerlink-appointed person before excavation work or similar activities are undertaken near Powerlink's plant.

• Powerlink, its servants and agents will not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify Powerlink against any claim or demand for any such loss or damage.

• Where work commences prior to obtaining Powerlink's plans, or Powerlink's instructions are not followed, the developer/constructor is responsible for all damages sustained to Powerlink's plant.

• Powerlink reserves all rights to recover compensation for loss or damage caused by interference or dam age, including consequential loss and damages to its cable network, or other property.

• All underground conduits and cover slabs must be presumed to contain asbestos. Refer to "Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC: 2018 (2005).]

• PCB (polychlorinated biphenyl) contamination may exist in some cables.

Remote or On-Site Location Assistance

If requested, Powerlink may provide either remote over –the-phone or on-site location assistance with locating Powerlink's plant. This assistance may include guidance on visually locating and protecting Powerlink plant when excavating. Please note that any markings or pegs placed on the site by Powerlink during any such visit are indications of approximate cable locations only. The constructor is responsible for all hand digging (potholing) to visually locate and expose POWERLINK'S plant.

If the constructor is unable to locate Powerlink's plant within five metres of indicative plan locations, they must contact Powerlink's Regional Officer for Local Security for further advice. Contact details are as follows;

Officers for Local Security:

Region name	Contact's name	Telephone number	Mobile number
Southern	Bruce Muhling	(07) 3860 2305	0417 294 210
Central	Jeff Anstey	(07) 4931 2718	0418 785 743
Northern	Steve Cazzulino	(07) 4789 5561	0418 875 137

When working in the vicinity of Powerlink's plant, please observe the following conditions:

Records

The first step before any excavation commences is to obtain records of Powerlink's plant in the vicinity of the work. For new work, records should be obtained during the initial planning and design stage. The records provided by Powerlink must also be made available to all construction groups on site. Where plant information is transferred to plans for the proposed work, care must be exercised to ensure that important detail is not lost in the process.

Location of Cables

Examining the records is not sufficient, as reference points may change from the time of installation. Records must also be validated when working in close proximity to underground plant. The exact location of plant that maybe affected must be confirmed by use of an electronic cable locater followed by careful hand excavation to the level of cover slabs or conduits. Hand excavation must be used in advance of excavators. If doubt exists with respect to interpretation of cable records, Powerlink's Regional Officer for Local Security must be contacted. Refer to the contact details above.

Electrical Cable Covers

Powerlink's cables have underground cable warning tapes installed above the cables with the wording 'high voltage cable' and some may also have additional mechanical protection. Please note that some cables are known to be buried without covers.

Supervision

Any work in close proximity (within cable easement or five metres from the cable) to Powerlink's cables will always require on site supervision arranged by Powerlink.

Proposed works

No placing or removal of soil by excavation, digging or by any other means is allowed in Powerlink's easement without prior specific written consent from Powerlink.

Excavating Near Cables

For all work within five metres of where the plant is shown on Powerlink's plans, the constructor is required to hand dig (pothole) and expose the plant to confirm its exact location before work can commence.

Excavating Parallel to Cables

If construction work is parallel to Powerlink's cables, then hand digging (potholing) at least every four metres is required to establish the location of all cables to confirm the exact location of Powerlink's plant before workcan commence. Generally, no restrictions are placed on excavations parallel to Powerlink's cables to a depthnot exceeding that of the cable and the entire excavation is located outside Powerlink's easement. If an excavation exceeds the depth of the cables and is within five metres of the edge of the easement (or within ten metres of the cable) it is likely that the covers or bedding material around the cables or conduits will move, and Powerlink must be contacted. Design for the installation of parallel infrastructure will need to take into account electrical issues, including induction and transferred potential. Please note that cable depths may change suddenly.

Excavating Across Cables

A minimum clearance of 150 mm above, below, and to the sides of cables must be maintained. A standard clearance between services must be maintained as set down by the individual authorities. If the width or depth of the excavation is such that the cable warning tapes are exposed or the cables being unsupported, then Powerlink must be contacted to determine whether the cables should be taken out of service, or whetherthey need to be protected or supported. In the case of high voltage cables, it is unlikely that Powerlink will be able to take the cables out of service, and is definitely not an option without a lead time of at least 12 months.A cable cover must never be removed without prior specific written approval. A cable cover and the warning tapes may only be replaced under the supervision of a Powerlink officer. Protective cover strips must never be omitted to allow separation between Powerlink's cables and other services.

Directional Boring Near Cables

When boring parallel to cables, it is essential that trial holes are carefully hand dug at regular intervals to validate the actual location of the Powerlink's conduits or cables before using boring machinery. Where it is required to bore across the line of cables, the actual location of the cables must first be proven by hand digging.A trench must be excavated one metre from the side of the cables where the auger will approach to ensure a minimum clearance of 150 mm from cables can be maintained.

Heavy Machinery Operation over Cables

If a heavy "crawler" or "vibration" type machinery is proposed to be operated over the top of cables, detailed engineering plans and supporting information must be submitted to Powerlink for its approval, or otherwise (in writing) prior to any on site work commencing.

Hot Work in Proximity to Exposed POWERLINK'S Plant and Underground Cables

Exposed underground electrical cables must be protected against the effects of heat by shielding or covering cables with a suitable material. Heating of exposed insulation is dangerous and must be avoided at all costs.

Explosives

Before using explosives in the vicinity of POWERLINK'S cables, clearances should be obtained from Powerlink's Design Engineer. If explosives are proposed to be used within 100 metres of cables, an engineering report demonstrating that no damage will be sustained to Powerlink's plant must be provided to Powerlink prior to using such explosives.

Damage Reporting

All damage to Powerlink's cables, conduits and pipes must be reported to Powerlink no matter how insignificant the damage appears to be. Even very minor damage to cable protective coverings can lead to eventual failure of cables through corrosion of metal sheaths and moisture ingress. Some cables contain oil, and dam-age may result in an oil leak which will seriously impact the performance of the cable and will be treated as an environmental incident. All work in the vicinity of any of Powerlink's plant that has been damaged should cease and the area should be vacated until a clearance to continue work has been obtained from an authorised Powerlink officer.

Please note that high voltage electrical cables, if damaged, can cause serious injury, or fatality. Extreme caution needs to be exercised at all times when working in close proximity to these cables.

Electricity emergencies all areas or after hours enquiries
24 Hours **1800 353 031**

Plant Solutions and Assistance

If Powerlink's plant location plans or visual location of Powerlink's plant by hand digging reveals that the location of this plant is situated wholly or partly where the developer or constructor plans to work, then Powerlink's Property Services & Management Team must be contacted on (07) 3866 1313 to discuss possible engineering solutions.

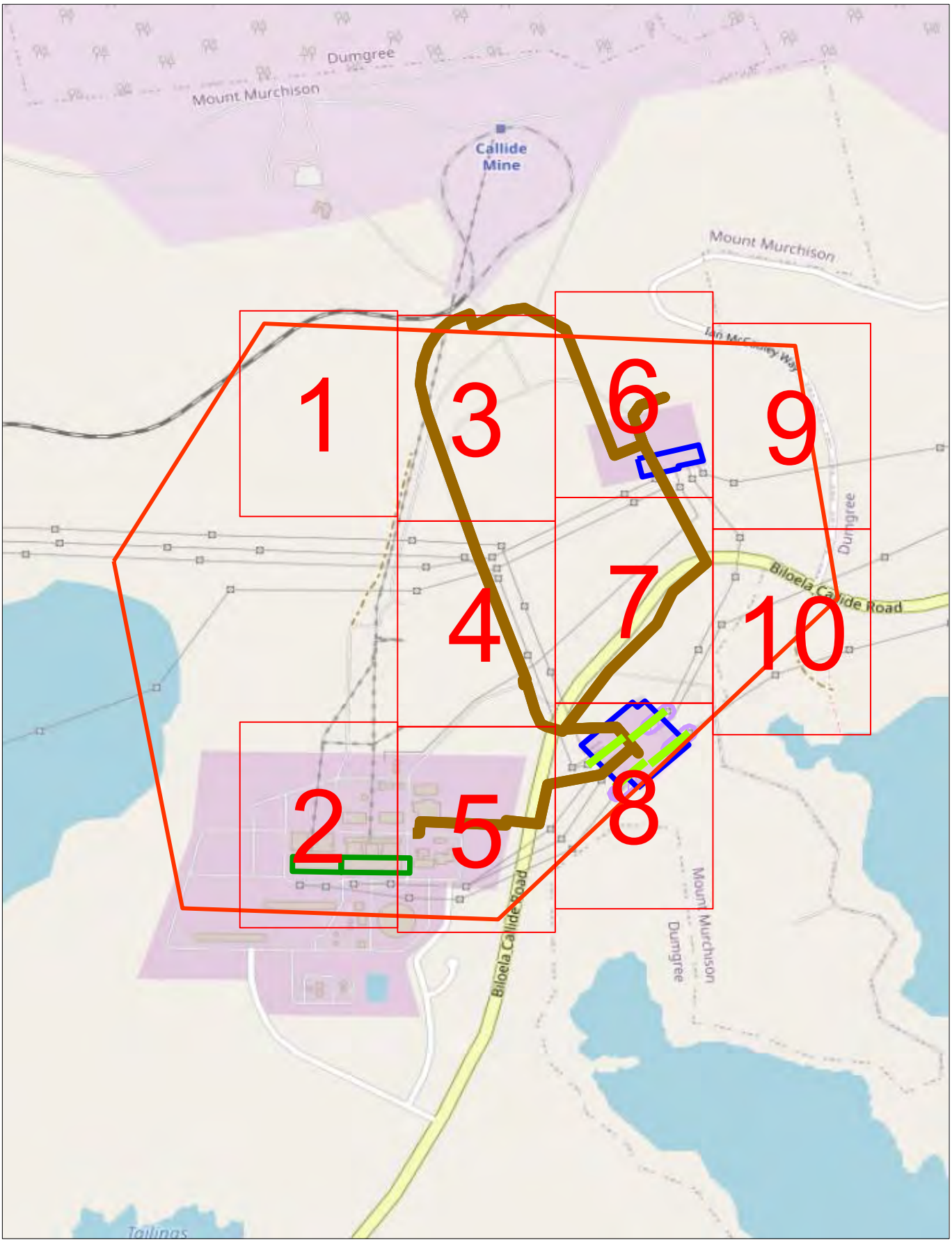
If detailed engineering assessment work, plant relocation, or protection works are part of the solution offered by Powerlink, then the cost of this work (the technical assessment and design, as well as the solution implementation cost) is recoverable by Powerlink from the principal developer or constructor. Powerlink will not commence work on the assessment and design until the developer or constructor provide a purchase order for these works. Powerlink will then provide a cost estimate for any proposed solution, and will not commence work on the solution until the developer or constructor provide a purchase order for the cost estimate.

Date: 24/05/2023

Overview Map

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



Powerlink Queensland makes every effort that the information contained on this map is up to date and correct but accepts no responsibility for this information.

The information is provided as a guide only. For up to date and specific information you should contact our Virginia office on (07) 3866 1313.

N S E W

LEGEND:

0 0.1km

Imagery sourced from Open StreetMaps

1	Detail Map Area		High Voltage Cable
	Powerlink Substation		Pilot Cable
	Other Substation		Optic Fibre
	Possible Comms		Decommissioned

Affected BYDA Work Area Symbols

Powered by: dbydsuite

Date: 24/05/2023

Map 1

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



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0 0.02km

Imagery sourced from Open StreetMaps

LEGEND:

- Powerlink Substation
- Other Substation
- Possible Comms
- High Voltage Cable
- Pilot Cable
- Optic Fibre
- Decommissioned

Affected BYDA Work Area Symbols

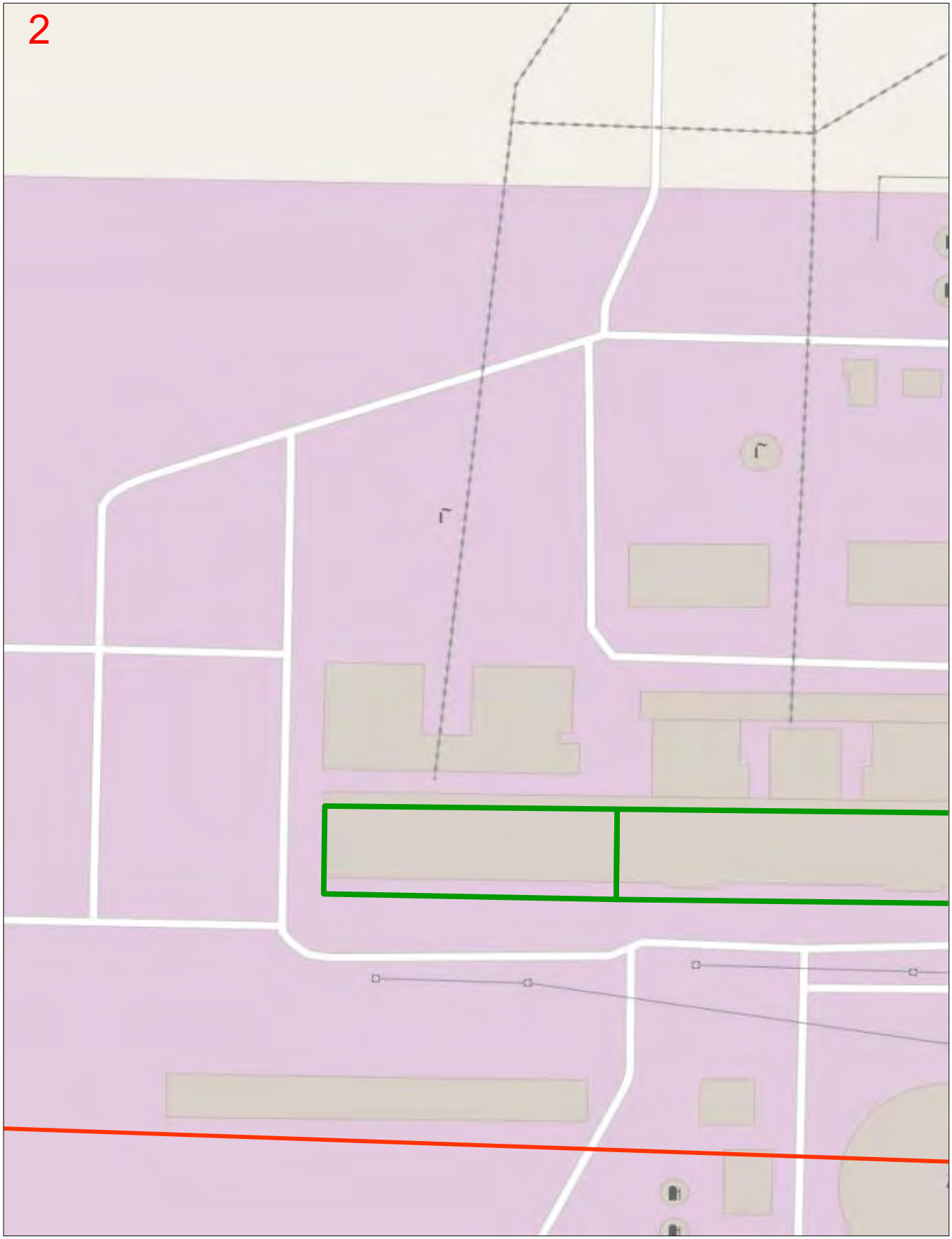
Powered by dbydsuite

Date: 24/05/2023

Map 2

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



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0 0.02km

Imagery sourced from Open StreetMaps

LEGEND:

- Powerlink Substation
- Other Substation
- Possible Comms
- High Voltage Cable
- Pilot Cable
- Optic Fibre
- Decommissioned

Affected BYDA Work Area Symbols

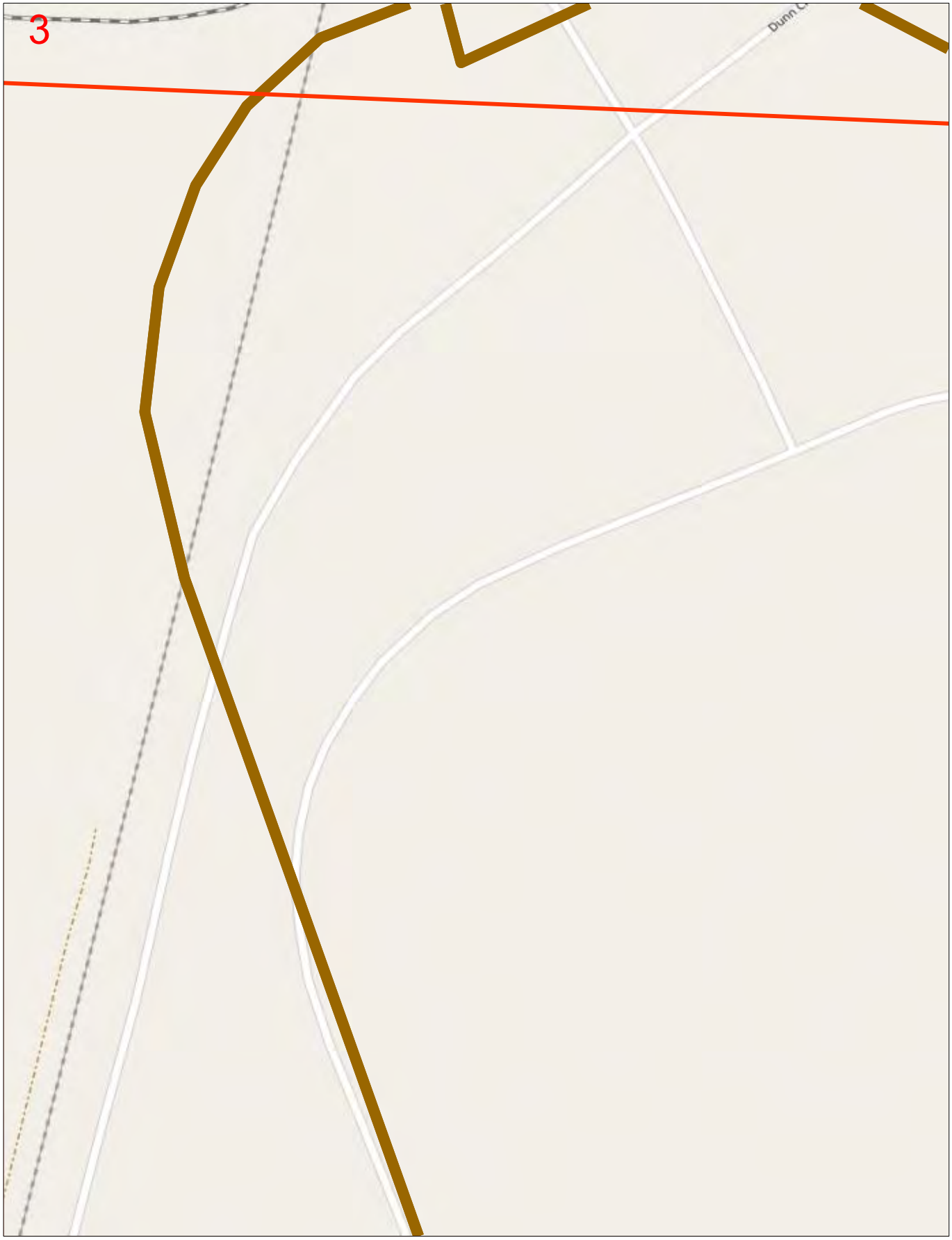
Powered by dbydsuite

Date: 24/05/2023

Map 3

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



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0 0.02km

Imagery sourced from Open StreetMaps

LEGEND:

- Powerlink Substation
- Other Substation
- Possible Comms
- High Voltage Cable
- Pilot Cable
- Optic Fibre
- Decommissioned

Affected BYDA Work Area Symbols

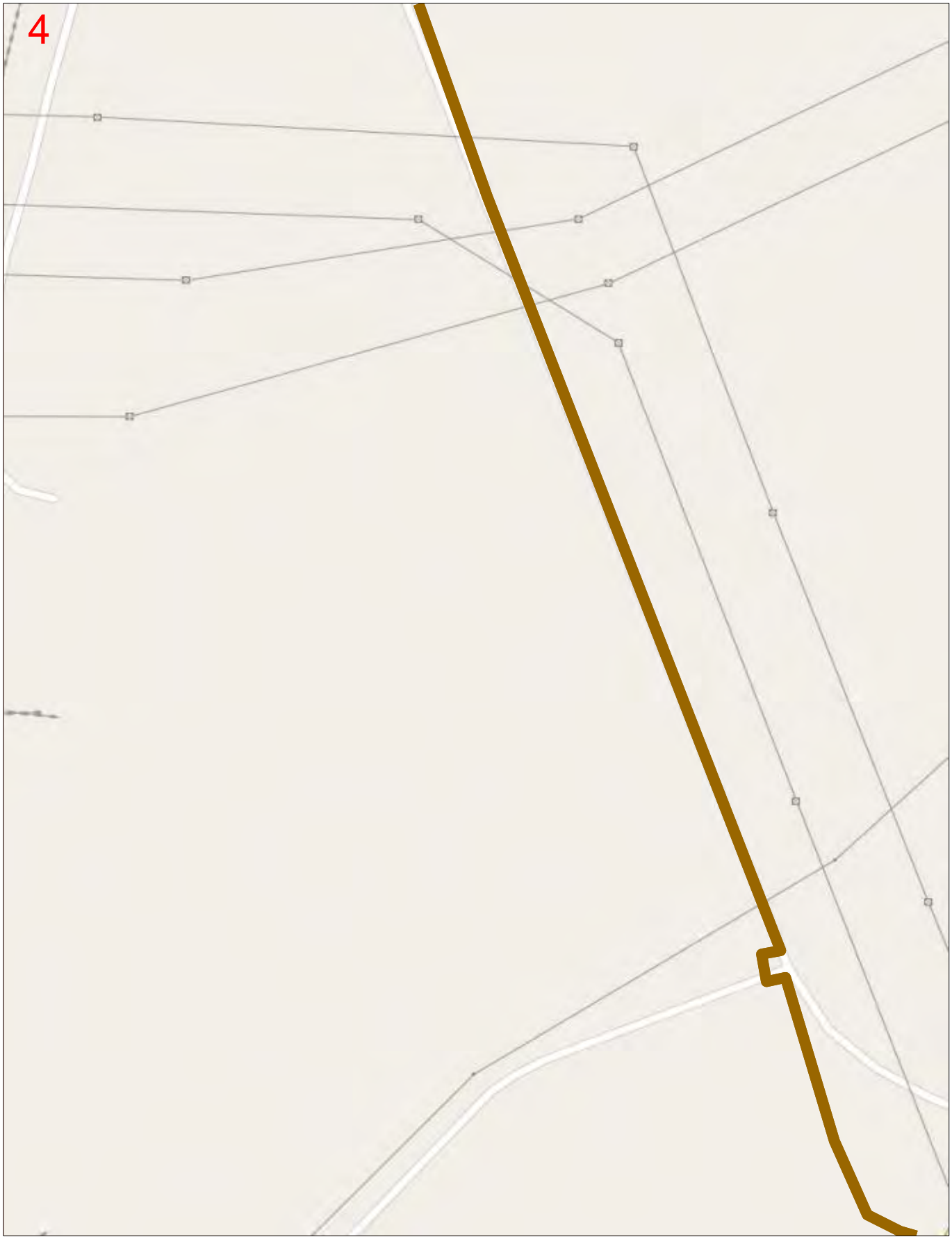
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Date: 24/05/2023

Map 4

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



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0 0.02km

Imagery sourced from Open StreetMaps

LEGEND:

- Powerlink Substation
- Other Substation
- Possible Comms
- High Voltage Cable
- Pilot Cable
- Optic Fibre
- Decommissioned

Affected BYDA Work Area Symbols

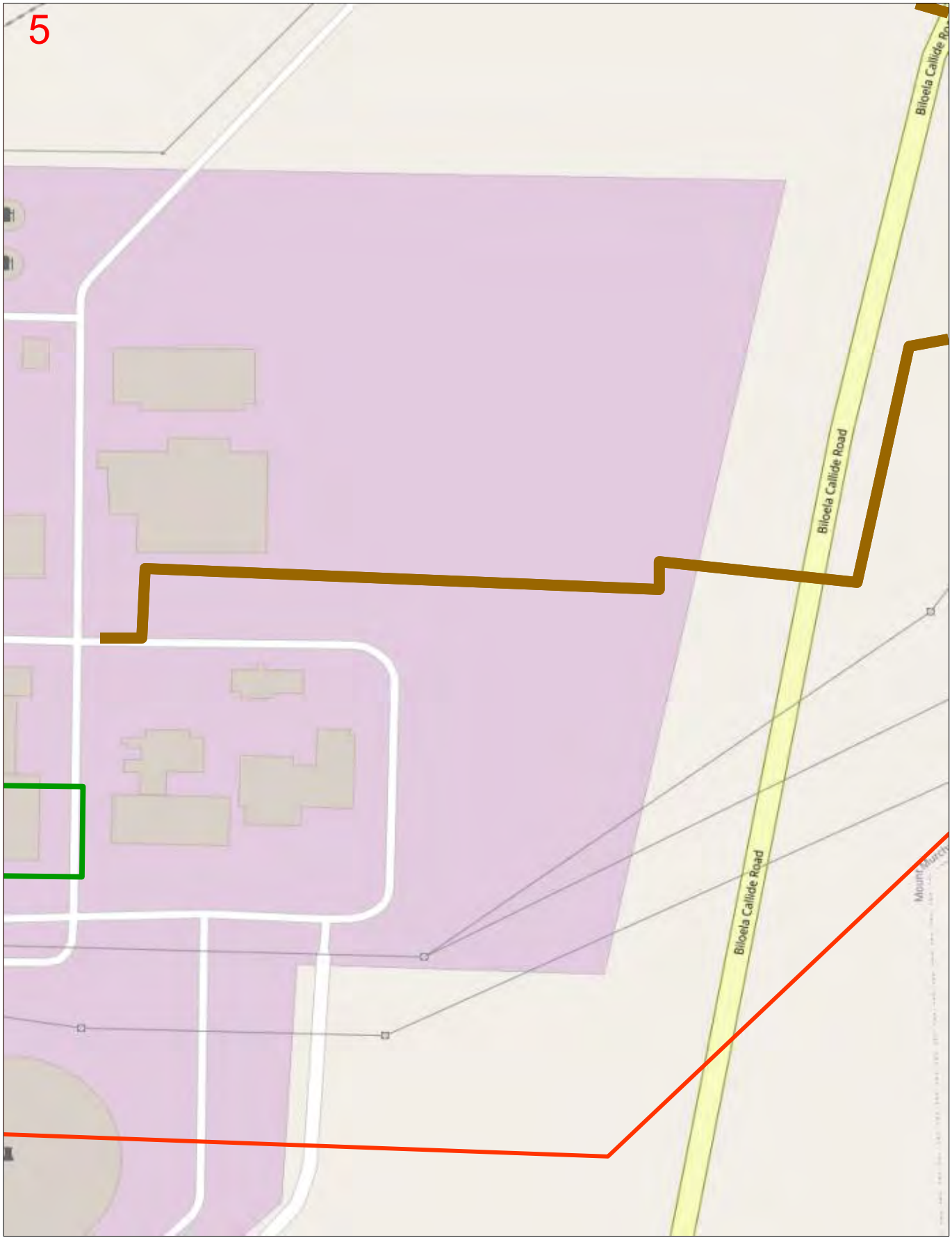
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Date: 24/05/2023

Map 5

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



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0 0.02km

Imagery sourced from Open StreetMaps

LEGEND:

- Powerlink Substation
- Other Substation
- Possible Comms
- High Voltage Cable
- Pilot Cable
- Optic Fibre
- Decommissioned

Affected BYDA Work Area Symbols

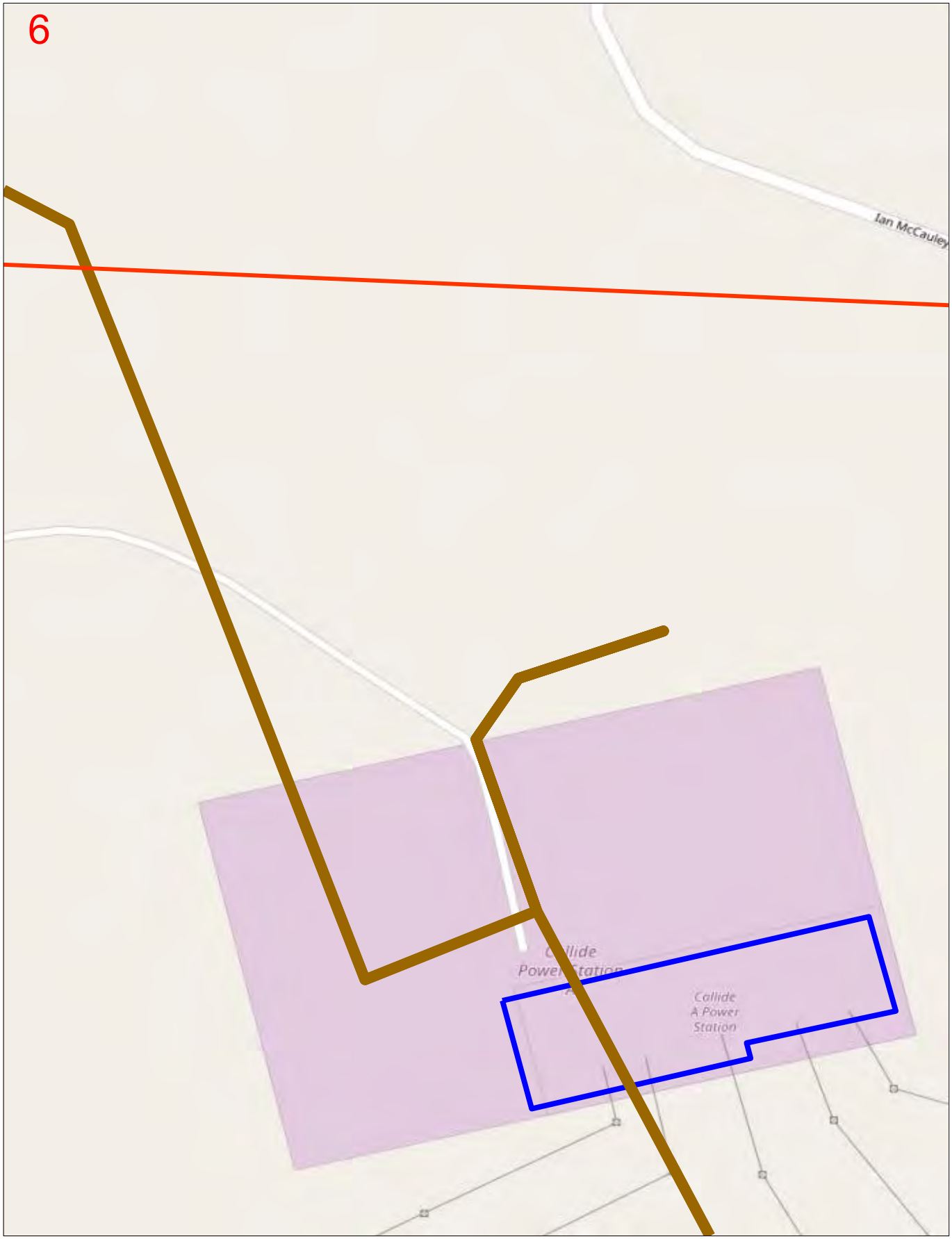
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Date: 24/05/2023

Map 6

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



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0 0.02km

Imagery sourced from Open StreetMaps

LEGEND:

- Powerlink Substation
- Other Substation
- Possible Comms
- High Voltage Cable
- Pilot Cable
- Optic Fibre
- Decommissioned

Affected BYDA Work Area Symbols

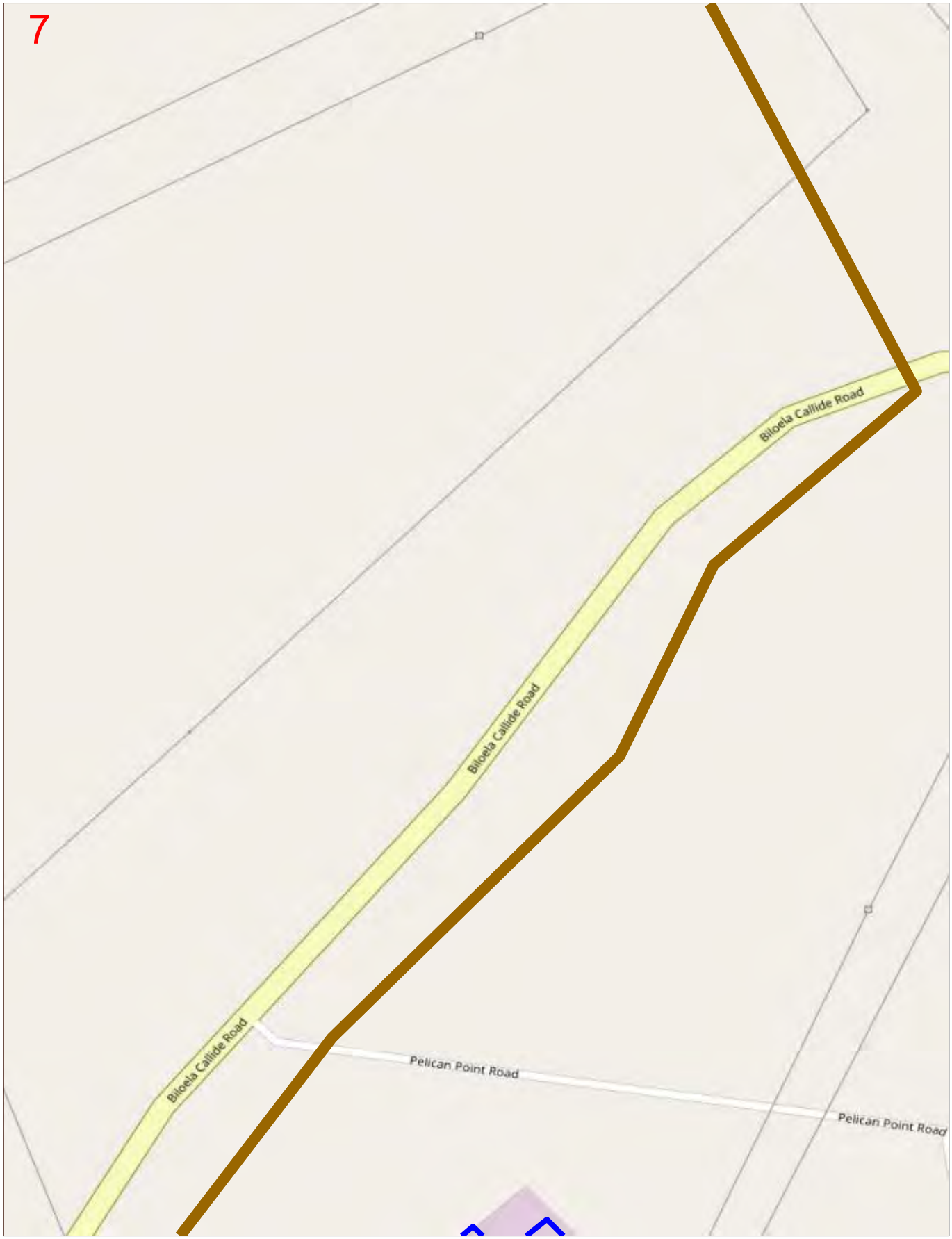
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Date: 24/05/2023

Map 7

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



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N W E S

0 0.02km

Imagery sourced from Open StreetMaps

LEGEND:

- Powerlink Substation
- Other Substation
- Possible Comms
- High Voltage Cable
- Pilot Cable
- Optic Fibre
- Decommissioned

Affected BYDA Work Area Symbols

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Date: 24/05/2023

Map 8

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



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N
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0 0.02km

Imagery sourced from Open StreetMaps

LEGEND:

- Powerlink Substation
- Other Substation
- Possible Comms
- High Voltage Cable
- Pilot Cable
- Optic Fibre
- Decommissioned

Affected BYDA Work Area Symbols

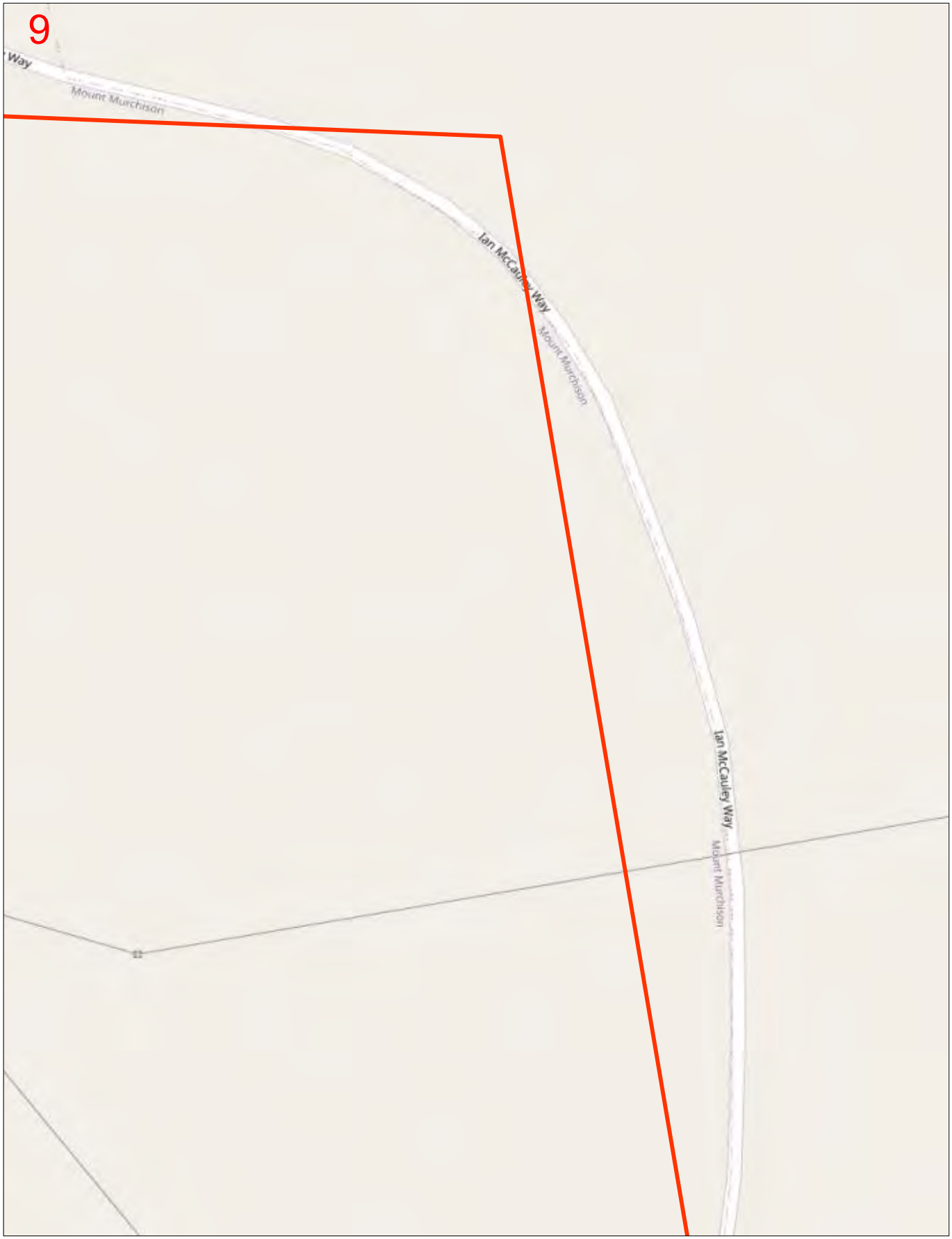
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Date: 24/05/2023

Map 9

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



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0 0.02km

Imagery sourced from Open StreetMaps

LEGEND:

- Powerlink Substation
- Other Substation
- Possible Comms
- High Voltage Cable
- Pilot Cable
- Optic Fibre
- Decommissioned

Affected BYDA Work Area Symbols

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Date: 24/05/2023

Map 10

Enquiry No: 224998129

1092 Biloela Callide Road Mount Murchison



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N W E S

0 0.02km

Imagery sourced from Open StreetMaps

LEGEND:

- Powerlink Substation
- Other Substation
- Possible Comms
- High Voltage Cable
- Pilot Cable
- Optic Fibre
- Decommissioned

Affected BYDA Work Area Symbols

Powered by dbydsuite

Paper size A3 Map has been designed to be reproduced in colour

All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ERGON ENERGY BYDA map, then ERGON ENERGY shall be contacted immediately.

For Emergency Situations please call 13 16 70



ERGON ENERGY NETWORK
Part of Energy Queensland

BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:8053

OVERVIEW

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

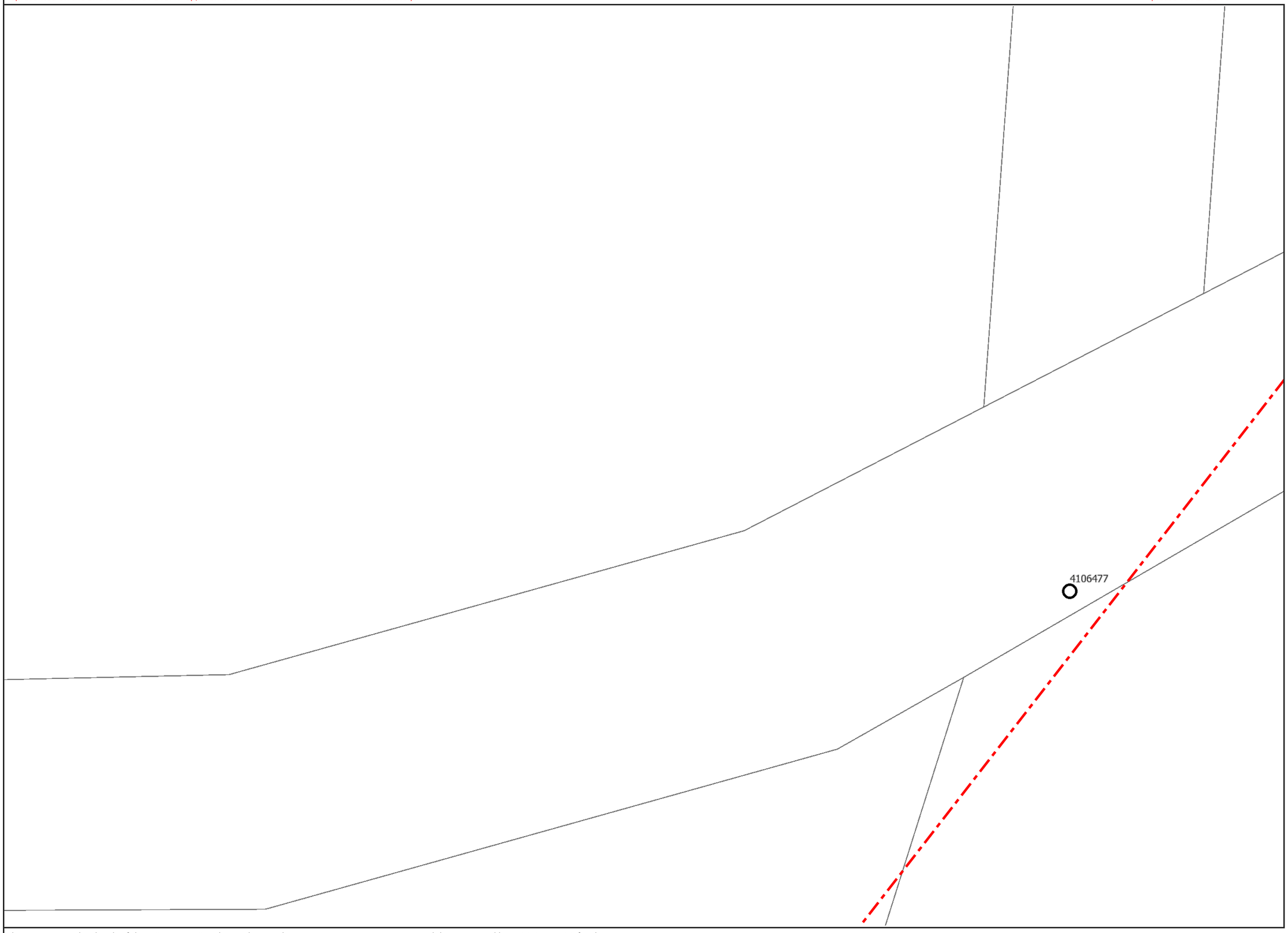
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This output provides details of the ERGON ENERGY electrical network. As variations map exist no responsibility is incurred by ERGON ENERGY for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

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ERGON ENERGY NETWORK
Part of Energy Queensland

BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 1

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

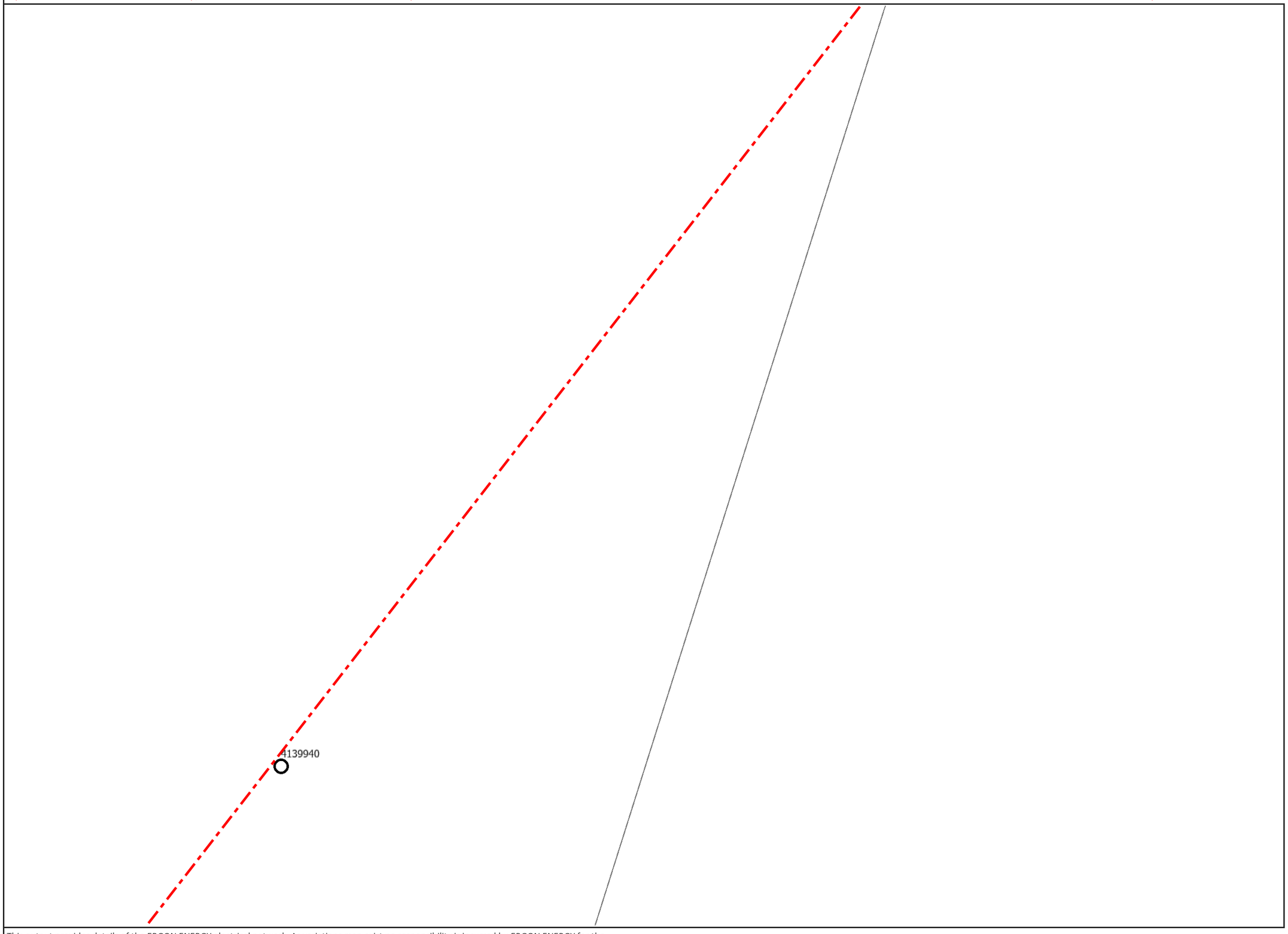
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ERGON ENERGY NETWORK
Part of Energy Queensland

BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 2

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

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ERGON ENERGY NETWORK
Part of Energy Queensland

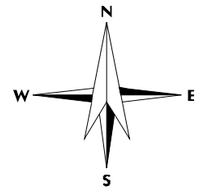
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Sequence: 224998131
Date: 24/05/2023

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For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

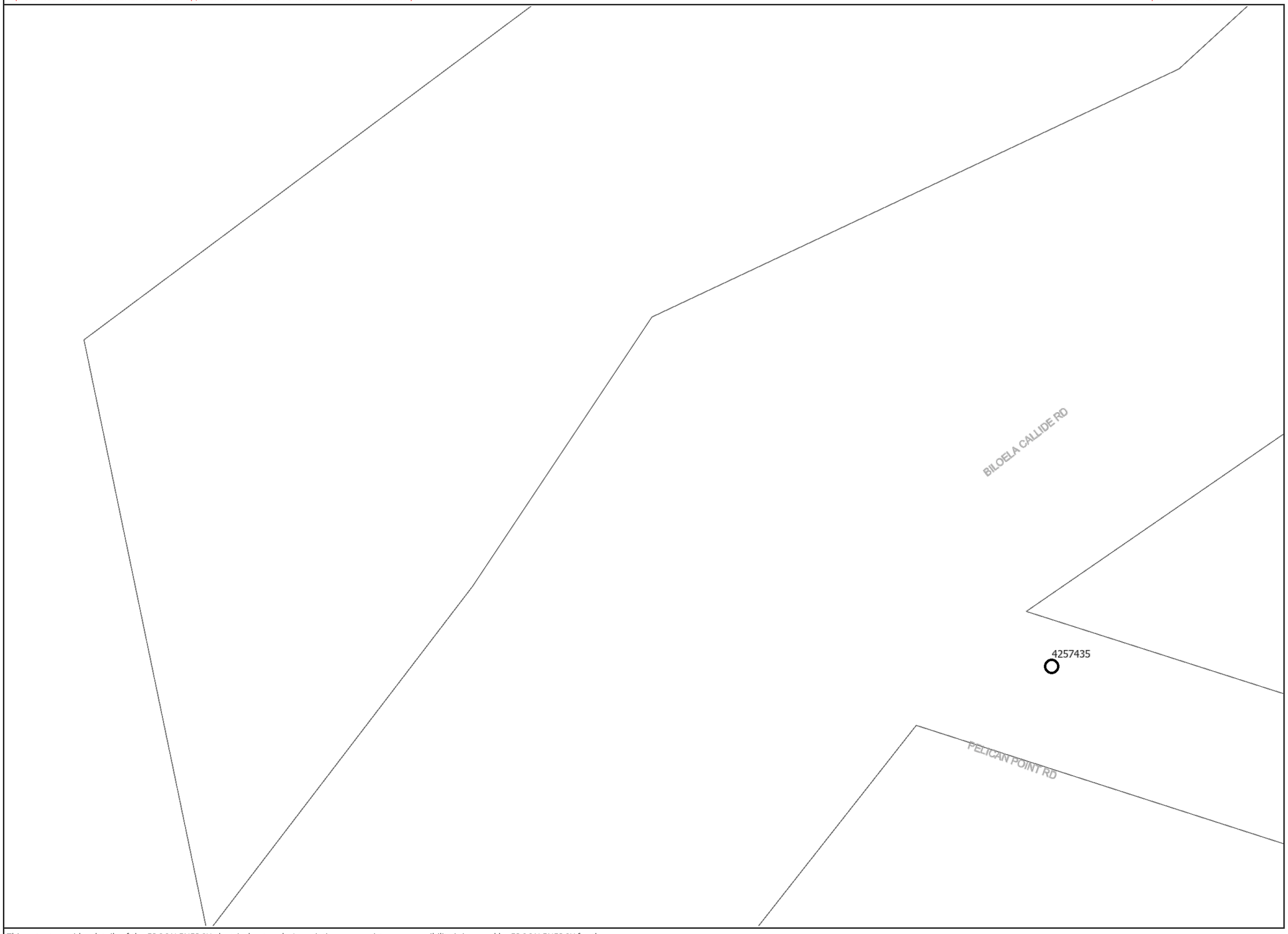


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ERGON ENERGY NETWORK
Part of Energy Queensland

BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 4

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

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Part of Energy Queensland

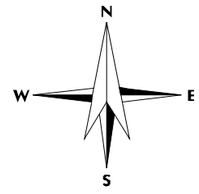
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 5

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

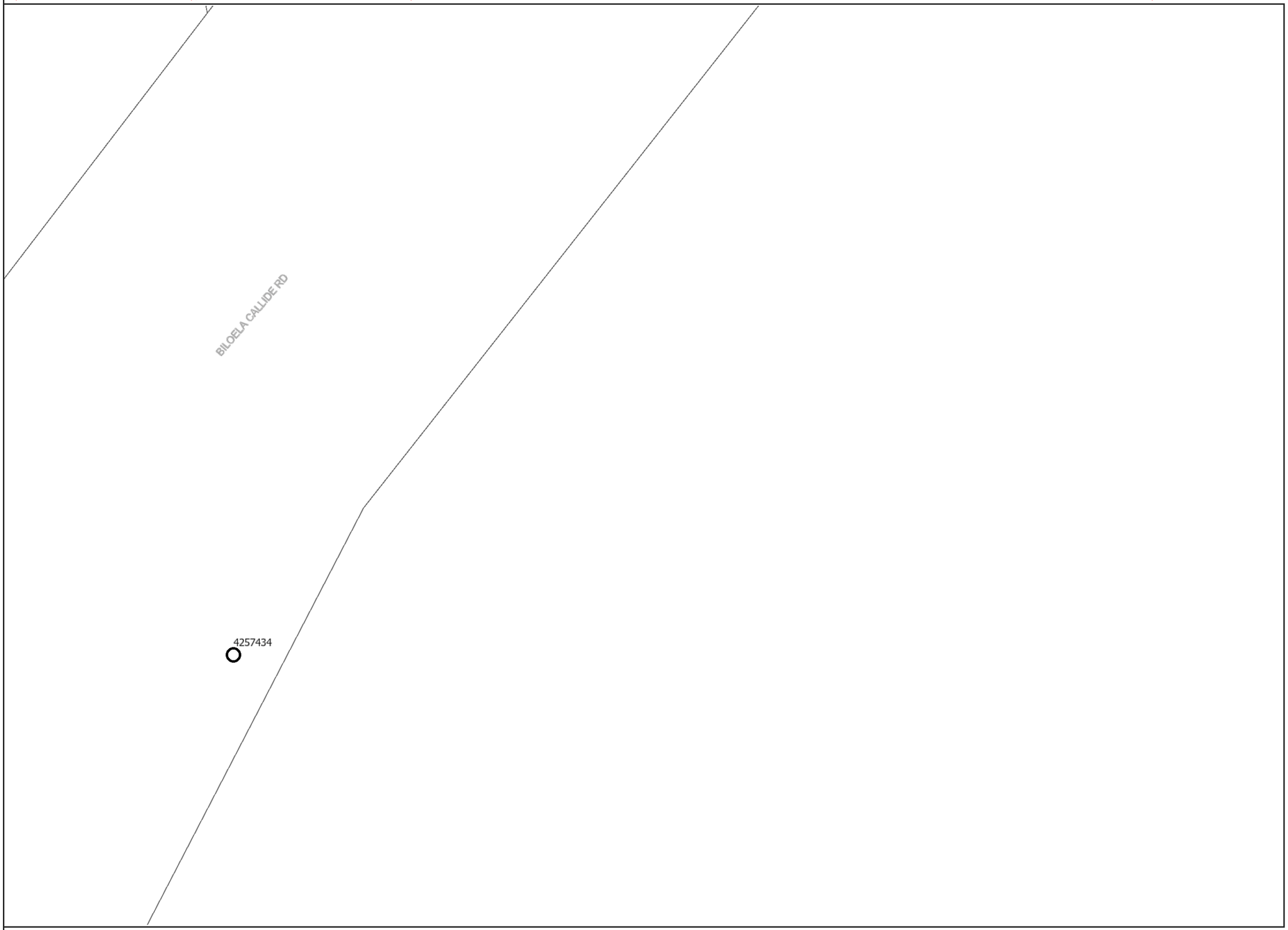
AS5488 Category "D" Plan



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Part of Energy Queensland

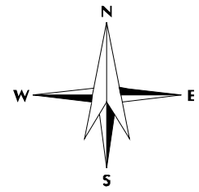
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 6

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

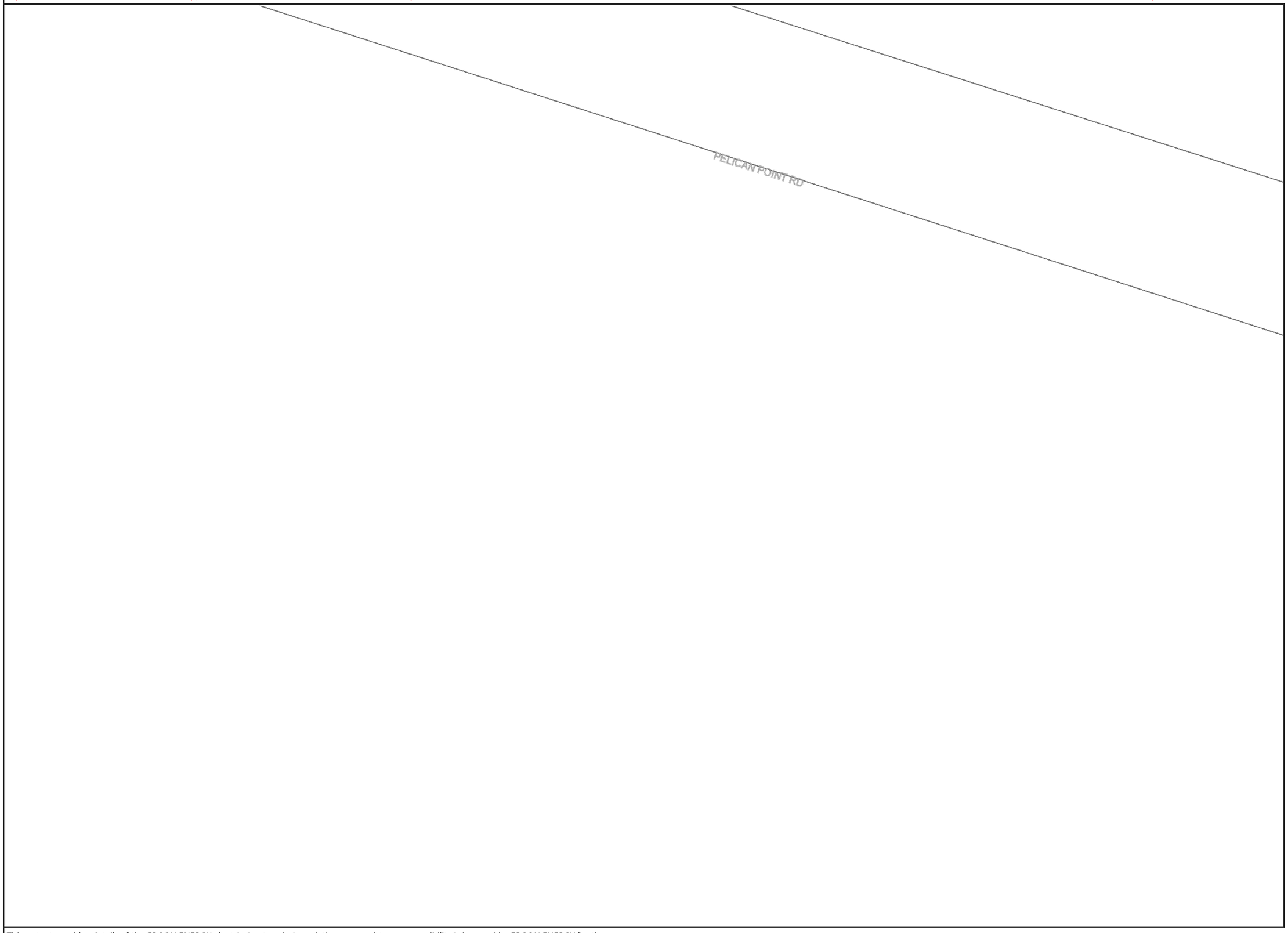
AS5488 Category "D" Plan



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For Emergency Situations please call 13 16 70



ERGON ENERGY NETWORK
Part of Energy Queensland

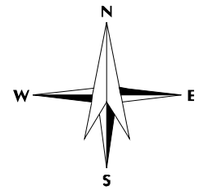
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 7

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

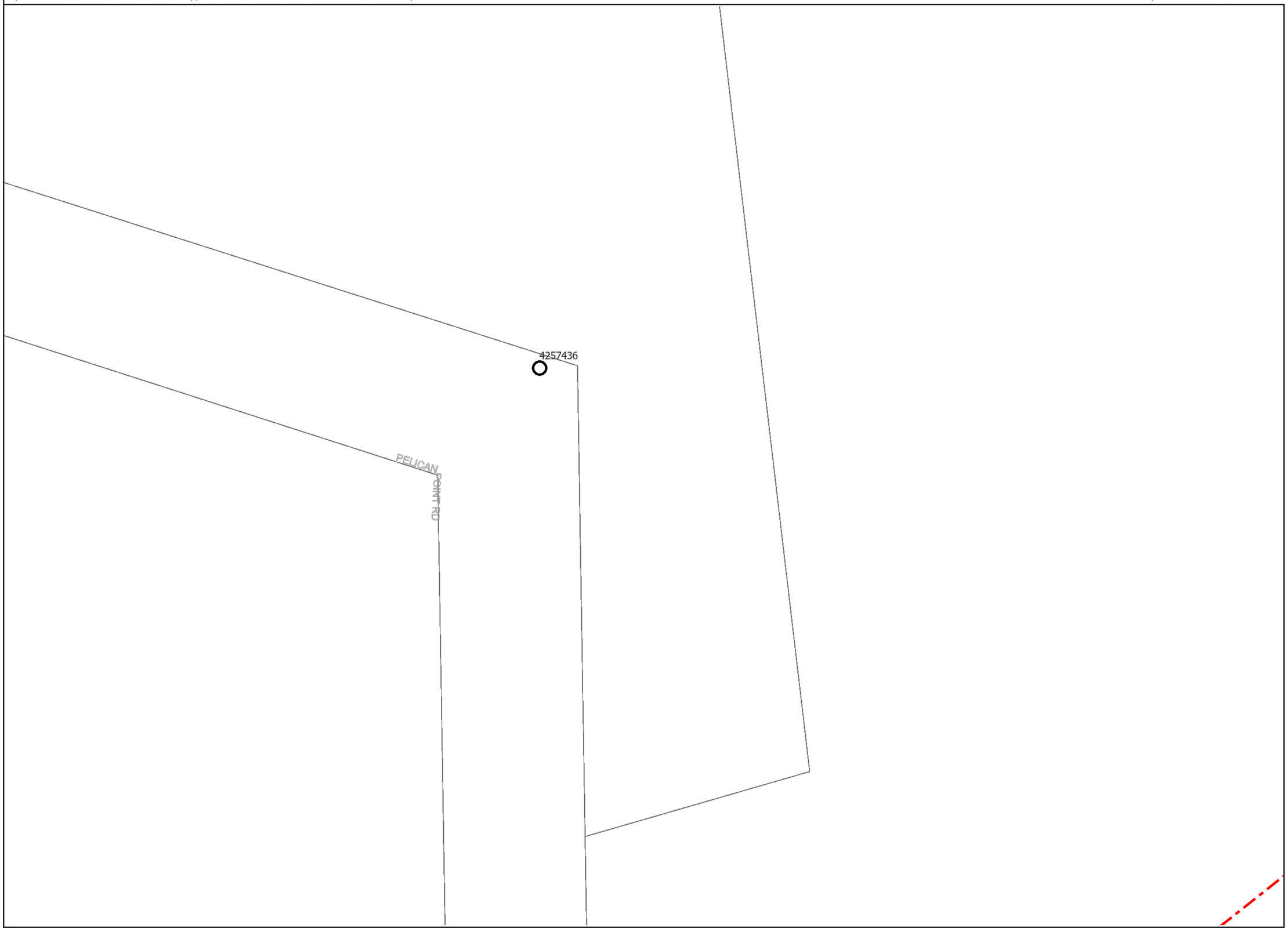


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ERGON ENERGY NETWORK
Part of Energy Queensland

BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 8

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

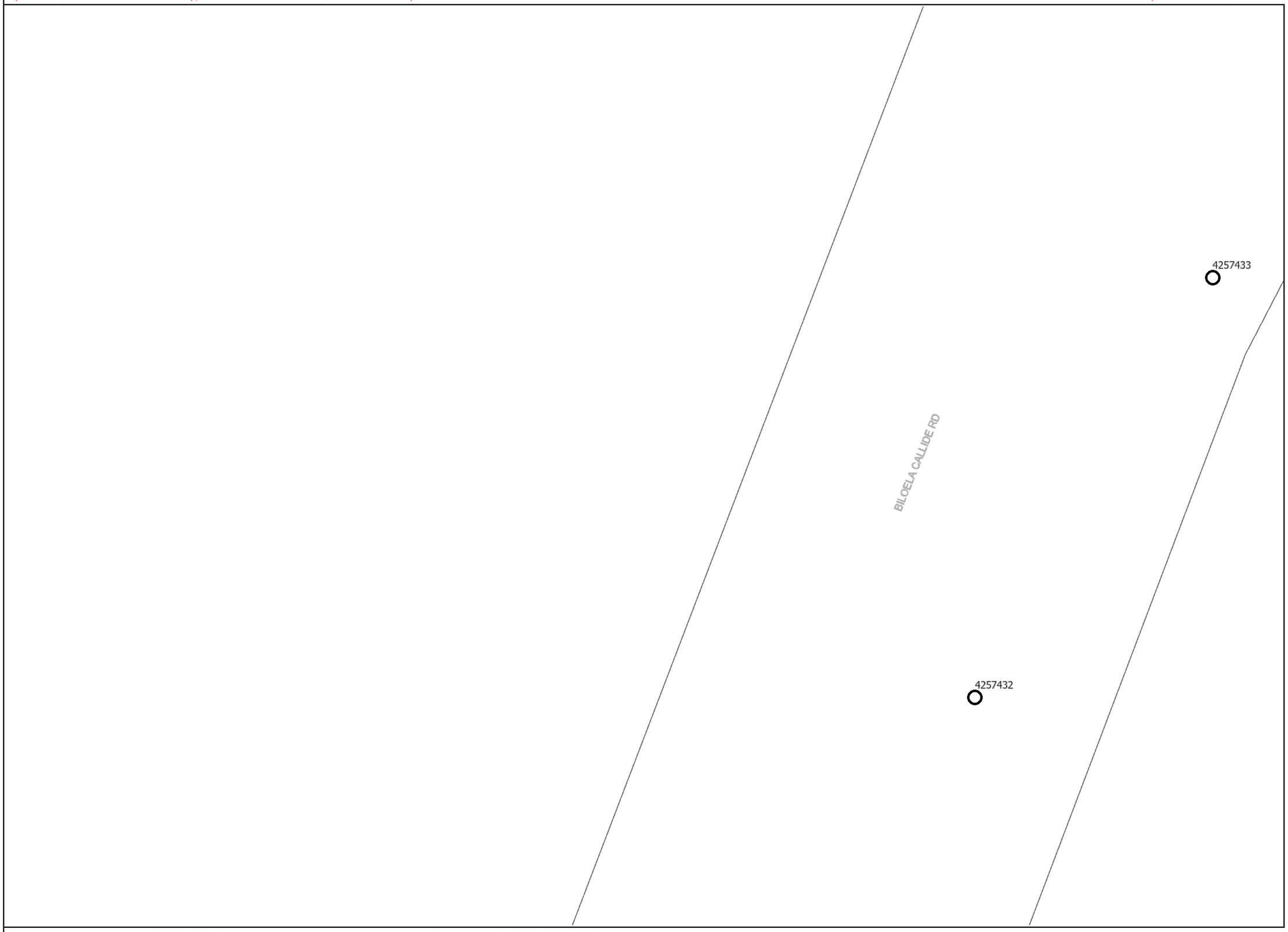
N
W E
S

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ERGON ENERGY NETWORK
Part of Energy Queensland

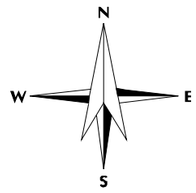
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 9

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan



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ERGON ENERGY NETWORK
Part of Energy Queensland

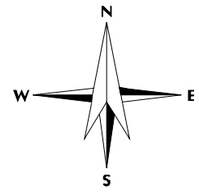
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 10

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

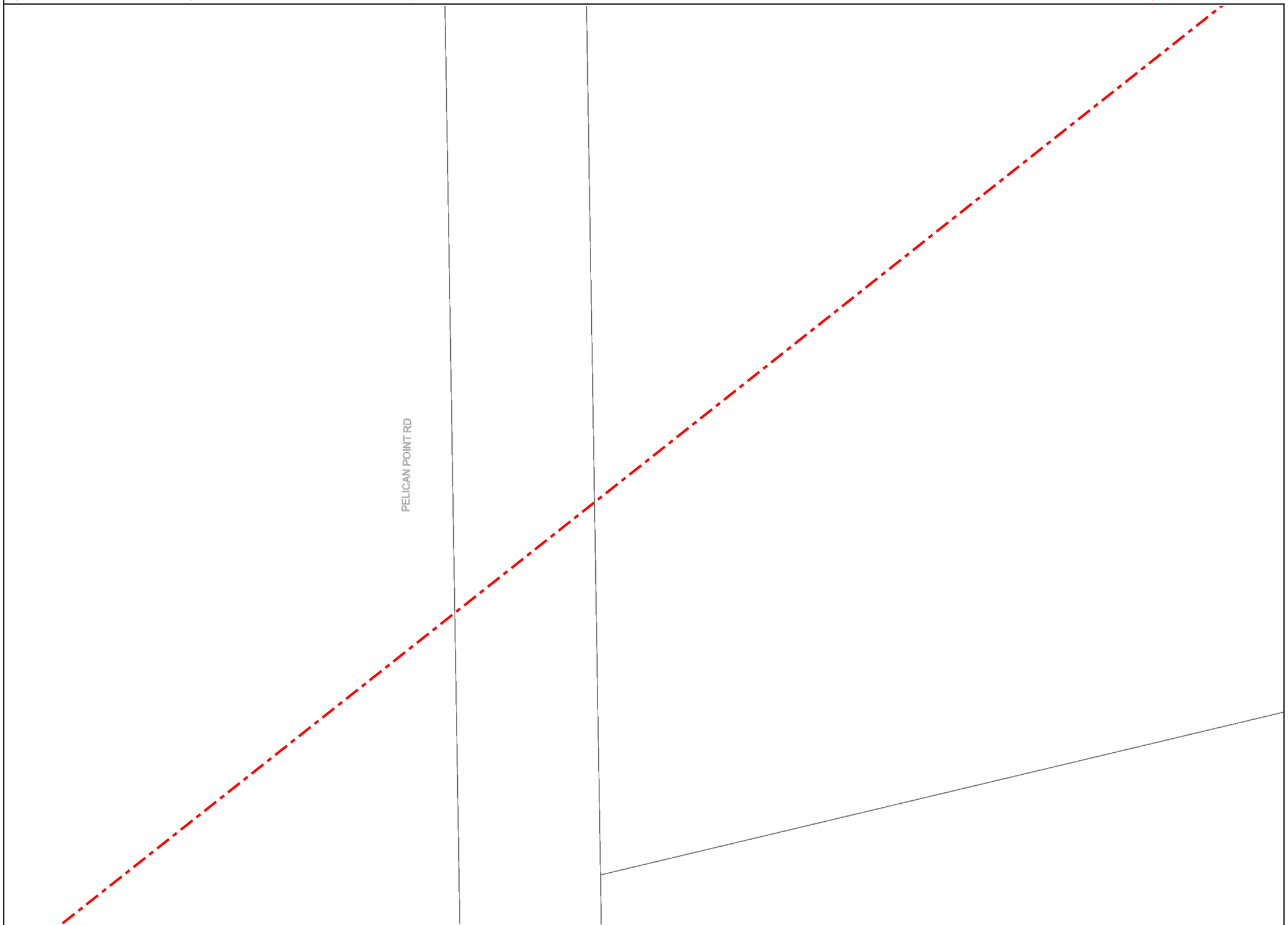


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ERGON ENERGY NETWORK
Part of Energy Queensland

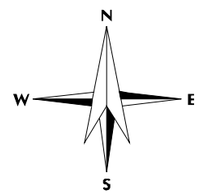
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 11

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

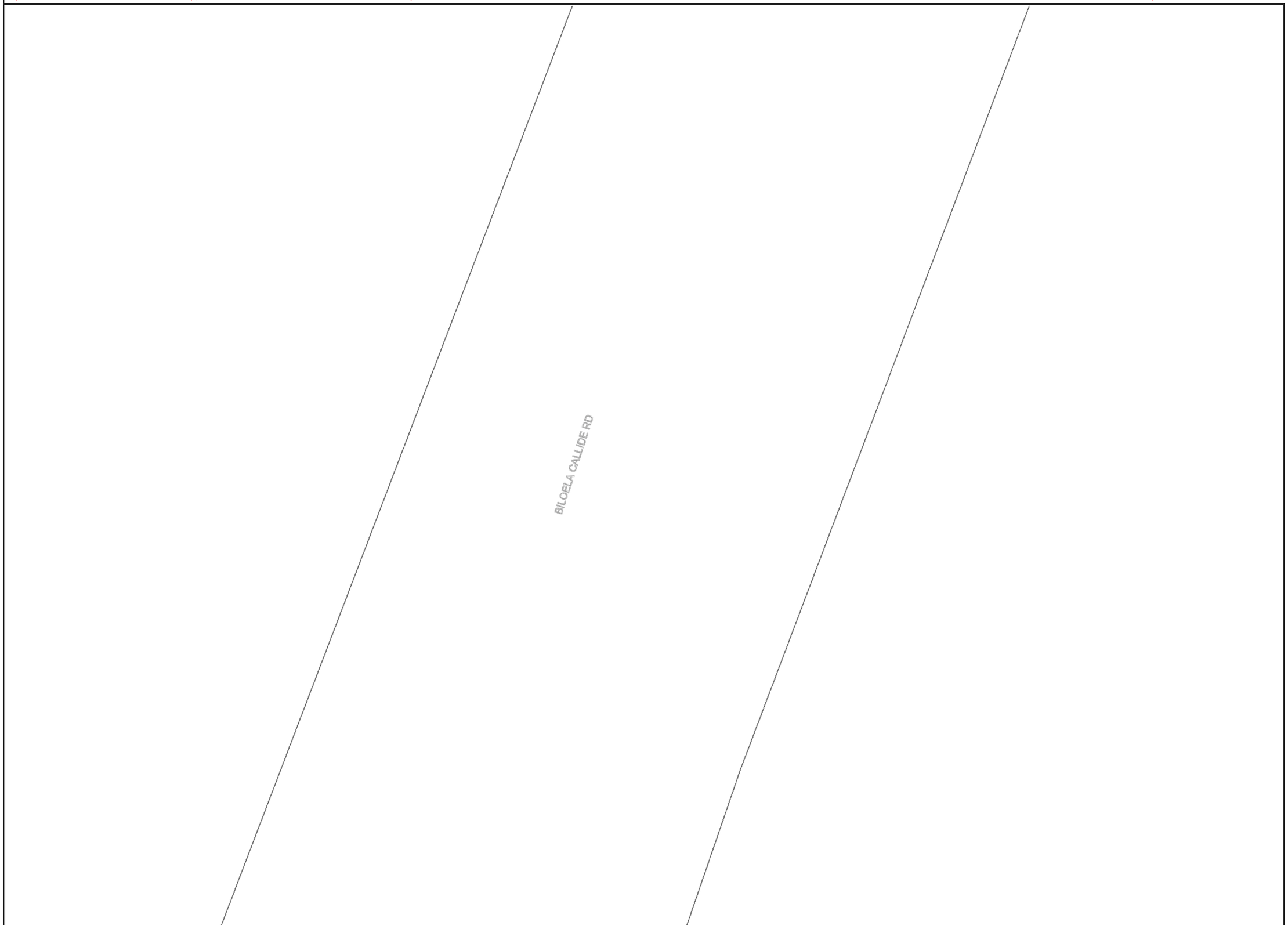


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ERGON ENERGY NETWORK
Part of Energy Queensland

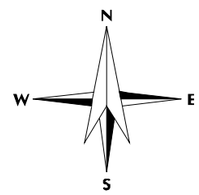
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 12

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

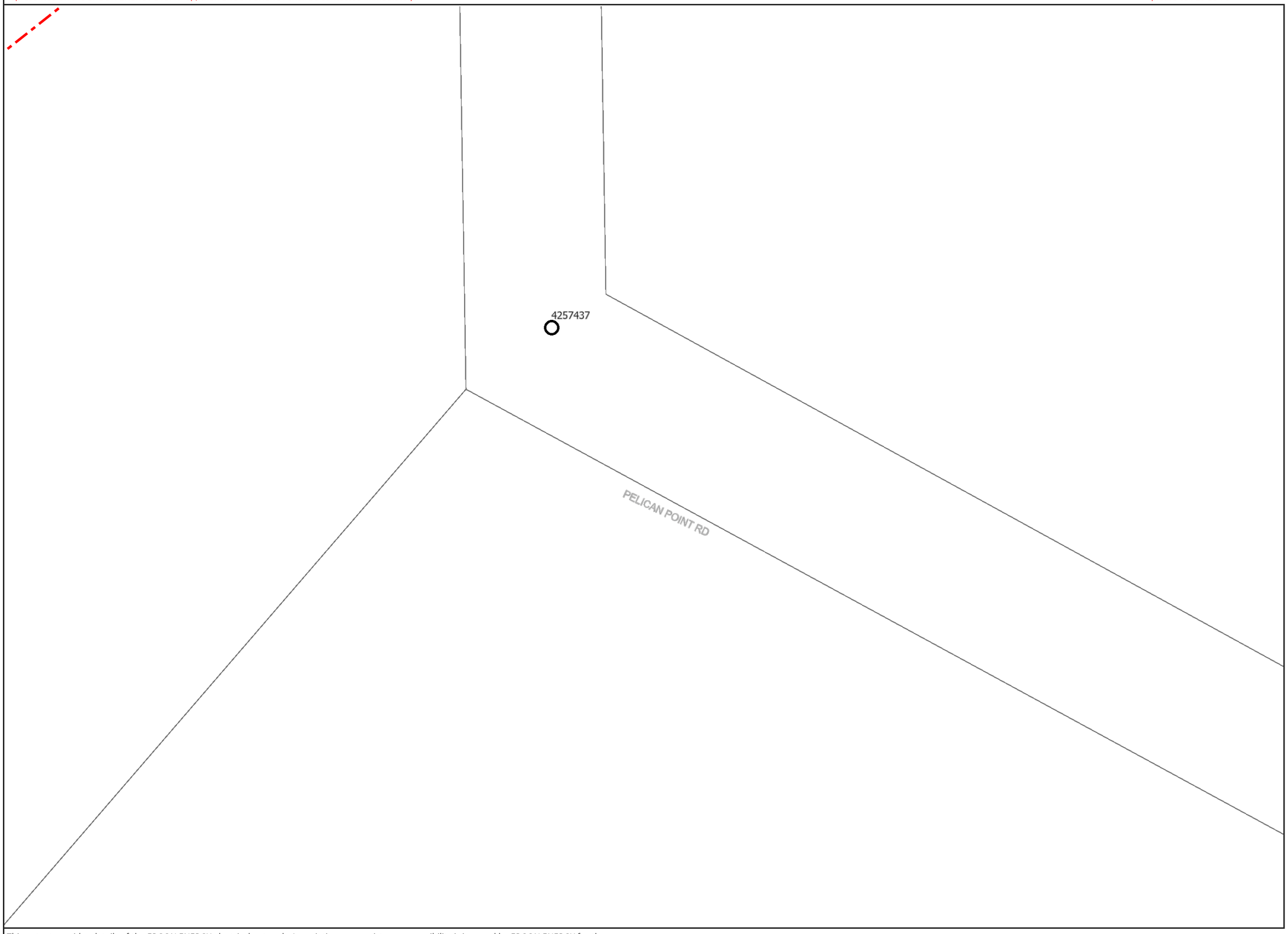


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ERGON ENERGY NETWORK
Part of Energy Queensland

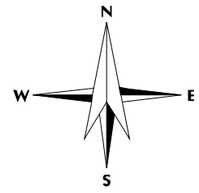
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 13

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

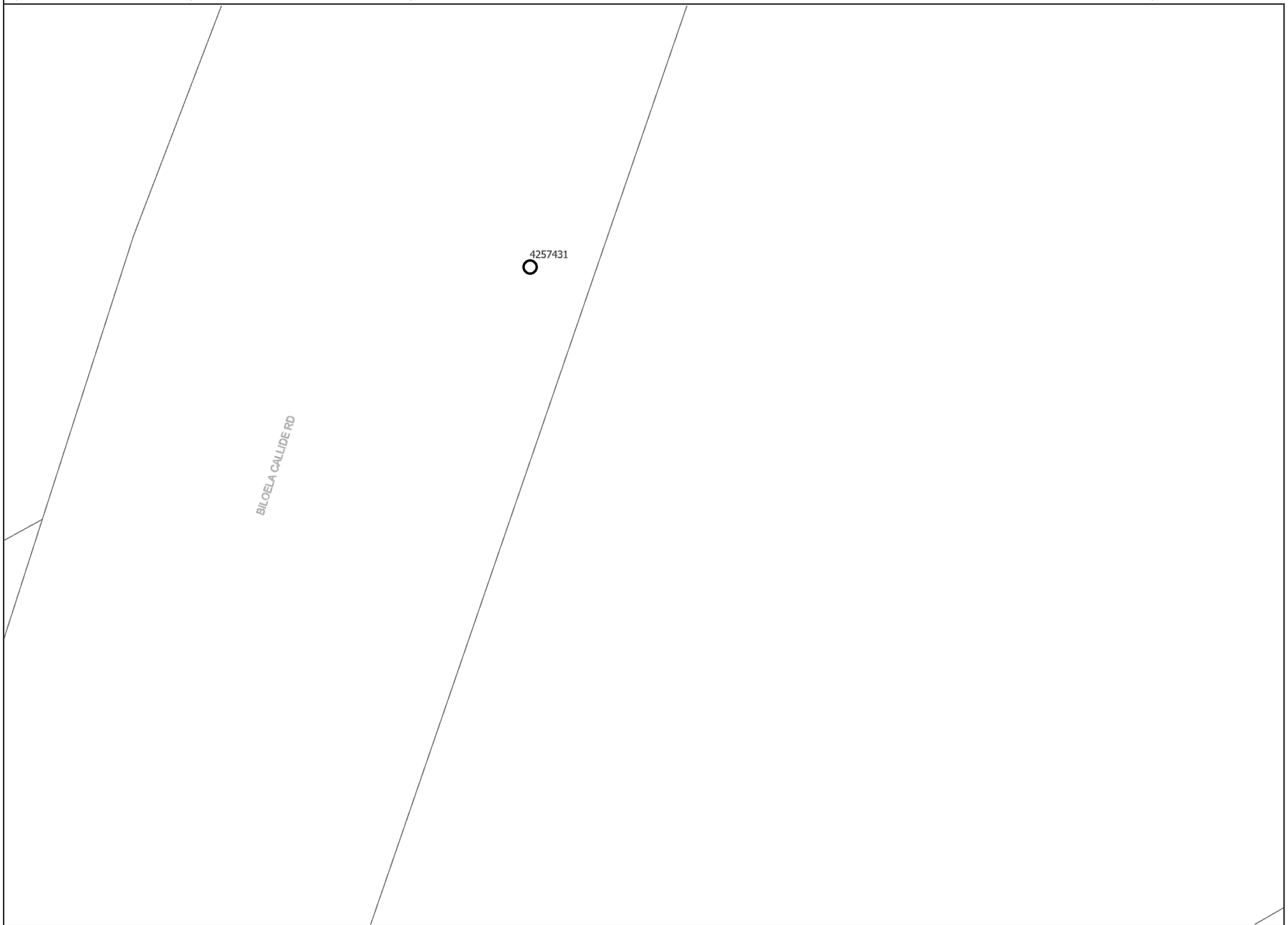


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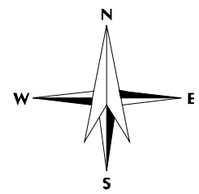
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 14

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan



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ERGON ENERGY NETWORK
Part of Energy Queensland

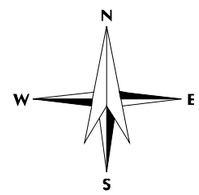
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 15

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan



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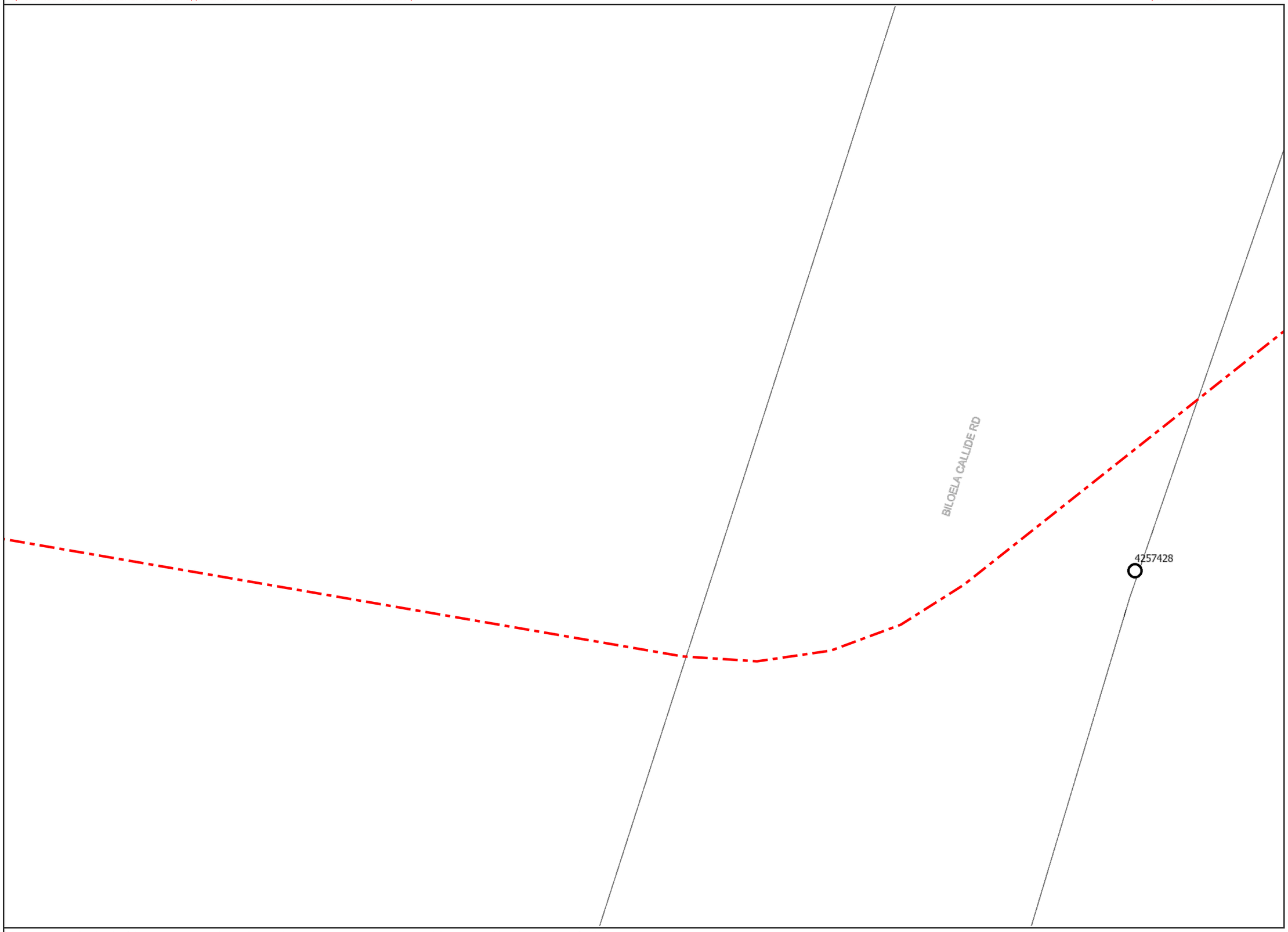
For Emergency Situations please call 13 16 70

ERGON ENERGY NETWORK
Part of Energy Queensland

BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 16



For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

N
W
E
S

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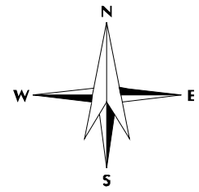
BYDA

Sequence: 224998131
Date: 24/05/2023

Scale: 1:500
Tile No: 17

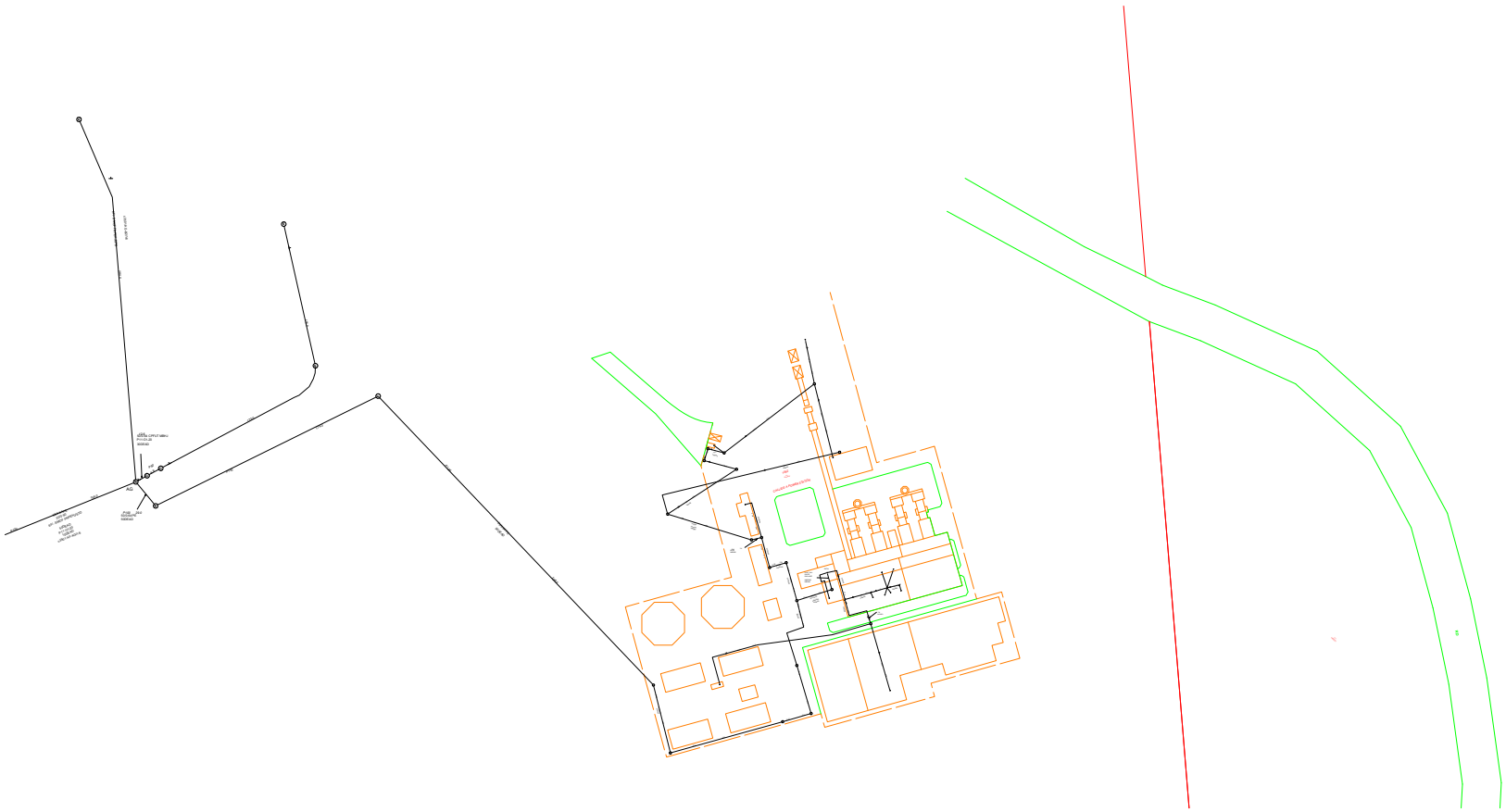
For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

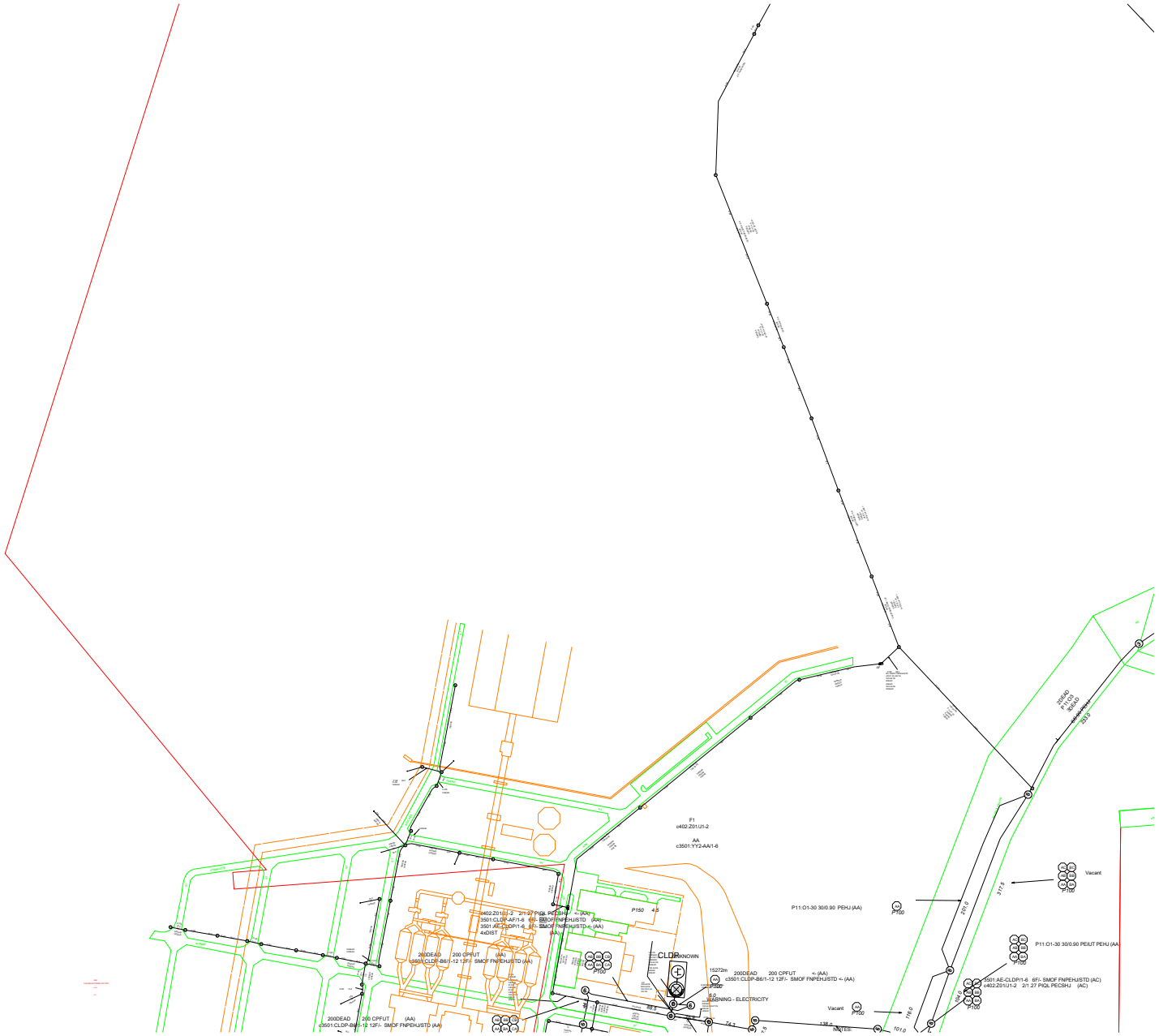
AS5488 Category "D" Plan



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F1
c402.Z01/J1-2
AA
c3501:YY2-AA/1-6
P150 4.5
P100
P11:O1-30 30/0.90 PEHJ (AA)
Vacant
P11:O1-30 30/0.90 PEIUT PEHJ (AA)
c3501:AE-CLDP/1-6 6FI- SMOF FNPEHJSTD (AC)
c402.Z01/J1-2 2/1.27 PIQL PECSHJ (AC)
CLDP
UNKNOWN
15272m
200DEAD 200 CPFUT <- (AA)
c3501:CLDP-B6/1-12 12F/- SMOF FNPEHJSTD <- (AA)
WARNING - ELECTRICITY
NOTES:
200DEAD 200 CPFUT (AA)
c3501:CLDP-B6/1-12 12F/- SMOF FNPEHJSTD (AA)
c402.Z01/J1-2 2/1.27 PIQL PECSHJ (AA)
c3501:CLDP-AF/1-6 6FI- SMOF FNPEHJSTD (AA)
3501:AE-CLDP/1-6 6FI- SMOF FNPEHJSTD <- (AA)
4xDIST
200DEAD
P1103
30/0.90
PEHJ (AA)
3331.5
3717.5
201.0
180.0
101.0
136.4
24.4
7.5
98.6
46.2
2.0
2.5

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003842-9003846 - INTERFACE METER

Plant Number: 235279

Probe Length: 60mt

ITEM	TEST	PASS	COMMENTS
Battery	Compartment / Capacity	☑	9v
Probe	Clean / Operation	☑	
Earth Lead	Check if equipped	☑	
Tape Check	Cleaned / Checked for cuts	☑	
Function test	At surface level	☑	

Note: Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Scott Crawford Date: 03 /04/ 23 Signed: S.

Accessories List:

Interface Meter	Tape Guide	Decon 90 Solution
Brush	Spare 9v Battery	Instruction Manual
Transport Box		

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003871 WATER QUALITY METER – MULTIFUNCTION

Plant Number: 1072254

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	393181 397396	☑
Conductivity	2.76 mS/cm @ 25°C	2.76 mS/cm		396172	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.0% in Sodium Sulphite	% Saturation in Air	12110	☑
ORP	240mV @ 25°C	240mV	-	398884/395163	☑

Battery Status 80 %	Temperature 19.2 °C
	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Scott Crawford Date: 26/05/23 Signed: S.

Accessories List:

User's Manual & USB	pH Sensor	Conductivity Sensor
Dissolved Oxygen Sensor with Wetting Cap	Redox (ORP) Sensor with Wetting Cap	Flow Cell 500ml
Comm Cable	Testing Cap	Storage Cap

BOREHOLE LOG CA17

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 1.4 mbgl
DIAMETER: 50 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		CA17-0.2		0.1	COAL SOOT - Black	D	VL		0.1
				0.2					0.2
				0.3					0.3
				0.4					0.4
				0.5					0.5
				0.6					0.6
		CA17-0.7		0.7	SANDY CLAY - Brown, medium to coarse grained, low plasticity		St		0.7
				0.8					0.8
				0.9					0.9
				1	SANDY CLAY - White, with brown mottle				1
SFA				1.1					1.1
				1.2					1.2
		CA17-1.4		1.3					1.3
				1.4	EOH @ 1.4 mbgl - Refusal on rock				1.4
				1.5					1.5
				1.6					1.6
				1.7					1.7
				1.8					1.8
				1.9					1.9

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG CA18

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 1.8 mbgl
DIAMETER: 50 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT				0.1	COAL SOOT - Black	D	VL		0.1
				0.2					0.2
				0.3					0.3
				0.4					0.4
		CA18-0.5		0.5					0.5
				0.6					0.6
				0.7					0.7
				0.8	GRAVELLY CLAY - light brown, with medium to coarse gravel		St		0.8
				0.9					0.9
		CA18-1.0		1					1
				1.1					1.1
SFA				1.2					1.2
				1.3	SANDY CLAY - Brown, medium plasticity	M	F		1.3
				1.4					1.4
				1.5					1.5
				1.6					1.6
				1.7					1.7
		CA18-1.8		1.8					1.8
				1.9	EOH @ 1.8 mbgl - Refusal on rock				1.9

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG CA19

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 1.3 mbgl
DIAMETER: 50 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT				0.1	COAL SOOT - Black	D	VL		0.1
		CA19-0.2		0.2					0.2
				0.3					0.3
				0.4	WEATHERED ROCK - red and white, fine grained				0.4
		CA19-0.6		0.5	GRAVELLY SAND - Fine grained, fine to medium gravels		D		0.5
				0.6					0.6
				0.7					0.7
				0.8					0.8
				0.9					0.9
				1					1
SFA		CA19-1.2		1.1	SANDY CLAY - Brown, low plasticity, trace gravel		St		1.1
				1.2					1.2
				1.3	EOH @ 1.3 mbgl - Refusal on rock				1.3
				1.4					1.4
				1.5					1.5
				1.6					1.6
				1.7					1.7
				1.8					1.8
				1.9					1.9

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

DAILY LOG

DATE:	**29/05/2023**
TIME START:	**12:00**
TIME END:	**17:00**

Project No: BC200153.03

Project Manager: MCK

Site: Callide Power Plant

Recorded by: DP

Other field Staff:

Contractors: All Clear Service Location – Allen James

PRE START

Planned tasks for the Day:

Arrive on Site and Complete Service Location

Equipment in use:

LV

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			
INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE					

DATE:	**29/05/2023**
TIME START:	**12:00**
TIME END:	**17:00**

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

Arrived in Gladstone at 8:15
Arrived on site at 10:30
Service Locator arrived at 13:15, completed in-person induction
All locations cleared by 16:45, some additional areas in Callide A were cleared near MW95, MW96 and MW97 along the access tracks
Left site at 17:00

DAILY LOG

DATE:	01/06/2023
TIME START:	7:00
TIME END:	17:00

Project No: BC200153.03

Project Manager: MCK

Site: Callide Power Plant

Recorded by: DP

Other field Staff:

Contractors: Mike Seefeld- Soiltech

PRE START

Planned tasks for the Day:

Install wells in Callide A

Equipment in use:

LV

ENVIRONMENTAL		**PHYSICAL**		**CHEMICAL**	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	**01/06/2023**
TIME START:	**7:00**
TIME END:	**17:00**

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- **Arrived on Site at 7:00**
- **Attempted to drill MW95,constantly hit refusal in multiple boreholes (MW95, MW95#2), one borehole reached ~5m before refusal, but the conditions in the bore made well installation too difficult (very ashy and gravelly)**
- **Drilled MW97, reached 0.5m into saturated zone (3.3 mbgl total depth) before refusal, attempted to drill second borehole (MW96#2) to try to reach 6m and only got to ~1.5m before refusal. Installed well in the 3.3m deep borehole**
- **Drilled multiple boreholes for MW96 (MW96, MW96#2, and MW96#3), was hitting refusal at or before 3 mbgl. One borehole reached 6 mbgl before refusal, but no water was present. A dry well was installed at this location (MW96#3). The well was installed at the side of the access road, could not be drilled into Ash Dam 2 as this area was not service located.**
- **Left site at 17:00**

DAILY LOG

DATE:	02/06/2023
TIME START:	7:00
TIME END:	12:30

Project No: BC200153.03

Project Manager: MCK

Site: Callide Power Plant

Recorded by: DP

Other field Staff: Dare Lawrence (CS Energy)

Contractors:

PRE START

Planned tasks for the Day:

Develop MW97

Take surface soil samples in Callide A

Take water sample from coal hoppers

Equipment in use:

LV

YSI

Pump

Dipping Tape

ENVIRONMENTAL		PHYSICAL		CHEMICAL	
HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES	HAZARDS	CONTROL MEASURES
		See SWMS			

DATE:	**02/06/2023**
TIME START:	**7:00**
TIME END:	**12:30**

INCLUDE MONITORING EQUIPMENT FIELD CALIBRATION/CHECK DETAILS IN THE NOTES BELOW AS APPROPRIATE

Emergency Response (actions, shut down switches, nearest phone, contacts list, first aid kits, fire extinguishers etc.):

See SWMS

Acknowledgements:

NAME	COMPANY	SIGNATURE	NAME	COMPANY	SIGNATURE

NOTES FOR THE DAY

- **Arrived on site at 7:00**
- **Collected surface soil samples from drainage line**
- **Water sample collected from access staircase between coal hoppers, as there was insufficient water volume in the coal hoppers. There is connectivity between the coal hoppers and access staircase.**
- **Purged MW97 dry**
- **Finished COC and began demob**
- **Delivered samples to ALS at 16:00**
- **Arrived in Brisbane at 8:00pm**

BOREHOLE LOG MW95

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 5.5 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259312.57
NORTHING: 7306981.00
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		MW95-0.2		0	FILL - Gravelly clay, brown, with fine to medium gravels	D	VSt		0
				0.5	FILL - Gravelly sand, brown, with medium to coarse gravel		VL		0.5
		MW95-1.0		1	COAL SOOT - Black				1
					FILL - Sandy gravel, white subangular gravels with brown medium grained sand, mild weathering		H		
		MW95-2.0		1.5					1.5
				2	ASH - Grey, fine		VL		2
				2.5					2.5
				3					3
				3.5					3.5
SFA					FILL - Sandy gravel, white subangular gravels with brown medium grained sand, mild weathering		H	Other assorted rocks also present in fill material	
		MW95-4.0		4					4
				4.5					4.5
				5				Gravelly, ashy fill material makes well installation not feasible	5
				5.5	EOH @ 5.5 mbgl - Refusal on fill				5.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG MW95#2

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 3.0 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259314.40
NORTHING: 7306963.41
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
SFA				0	COAL SOOT - Black	D	VL		0
				0.5	CLAY - Brown, with medium to coarse gravels, medium plasticity	M	F		0.5
				1					1
				1.5					1.5
		MW95#2-2.0		2					2
				2.5				No well installed due to refusal with no water strike	2.5
				3	EOH @ 3.0 mbgl - Refusal				3
				3.5					3.5
				4					4
				4.5					4.5
				5					5
				5.5					5.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG MW96

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 3.0 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259321.35
NORTHING: 7307020.26
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		MW96-0.2		0	SANDY CLAY - Red and brown, medium grained sand	D	St	Rootlets to 0.3 mbgl	0
				0.5					0.5
					SANDY CLAY - Brown, medium grained sand		Fb		
		MW96-1.0		1					1
				1.5					1.5
SFA		MW96-2.0		2	WEATHERED ROCK - Brown, very hard		H		2
				2.5					2.5
				3				Well not installed due to refusal and no water strike	3
					EOH @ 3.0 mbgl - Refusal				
				3.5					3.5
				4					4
				4.5					4.5
				5					5
				5.5					5.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG MW96#2

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 4.2 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259386.72
NORTHING: 7307009.19
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		MW96#2-0.2		0.5	FILL - Sandy clay, brown, with fine to medium gravels	D	St		0.5
		MW96#2-0.8			ASH - Grey, fine		VL		
				1	SANDY CLAY - Brown, fine to medium grained, trace rootlets		St		1
		MW96#2-2.0		1.5					1.5
				2	GRAVELLY SANDY CLAY - Brown, fine to medium gravels, fine to medium grained, trace rootlets				2
		MW96#2-3.0		2.5					2.5
				3	Same as above, but light brown				3
SFA		MW96#2-4.0		3.5					3.5
				4					4
				4.5	EOH @ 4.2 mbgl - Refusal				4.5
				5					5
				5.5					5.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

GROUNDWATER WELL LOG MW96#3

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 6.0 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259425.37
NORTHING: 7306981.48
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Well Installation Details	Depth (m)
SFA				0	FILL - Sandy clay, brown, with fine to medium gravels	D	St		Grout	
				0.5	ASH - Grey, fine		VL			
				1	SANDY CLAY - Brown, fine to medium grained, trace rootlets		St		Bentonite	
				1.5						
				2	GRAVELLY SANDY CLAY - Brown, fine to medium gravels, fine to medium grained, trace rootlets					
				2.5						
				3	Same as above, but light brown					
				3.5						
				4					Gravel	
				4.5						
				5						
				5.5				Reached target depth without water strike, a dry well was installed		
		MW96#3-6.0		6						
					EOH @ 6.0 mbgl - Target depth					

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

GROUNDWATER WELL LOG MW97

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 3.3 mbgl
DIAMETER: 150mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259480.65
NORTHING: 7306996.94
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Well Installation Details	Depth (m)
PT		MW97-0.2		0.5	SANDY CLAY - Brown, fine to medium grained sand, non plastic	D	St	BD04_0106/SD04_0106 taken at 0.2 mbgl	Grout, Bentonite	
		MW97-1.0		1	SANDY CLAY - Brown with orange/grey mottle, fine grained, low plasticity	M	F			
				1.5	SANDY GRAVELLY CLAY - Brown and grey, with medium to coarse gravel, medium plasticity					
		MW97-2.0		2	GRAVELLY CLAY - Red and white, with coarse gravels		S		Gravel	
					White rock		H			
SFA				2.5	CLAY - Grey, with basalt fragments/gravels		S			
	▽					W		Water strike at 2.8 mbgl		
		MW97-3.3		3						
				3.5	EOH @ 3.3 mbgl - Refusal					
				4						
				4.5						
				5						
				5.5						
				6						

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG MW97#2

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 1.8 mbgl
DIAMETER: 150mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259491.69
NORTHING: 7306986.71
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
SFA				0.5	SANDY CLAY - Brown, fine to medium grained sand, non plastic	D	St	Refusal on rock before water strike, well not installed in this bore	0.5
				1	SANDY CLAY - Brown with orange/grey mottle, fine grained, low plasticity	M	F		1
				1.5					1.5
				2	EOH @ 1.8 mbgl - Refusal				2
				2.5					2.5
				3					3
				3.5					3.5
				4					4
				4.5					4.5
				5					5
				5.5					5.5
				6					6

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

Well Development

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW97
Job No:	BC200153.03	Date:	2/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	0.68 m
Well Material:	☐ PVC ☒ SS ☐ Other:	Screen Interval – Top (m BTOC)	~~2.5~~ 2.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	~~4.0~~ ~~4.0~~ 4.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	2.58	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	~~3.50~~ ~~3.75~~ 4.0	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
2/6/23	~~~~ ~4L	7.64	663	28.3	3.72	43.5		brown		23.3
3/6/23	~4L	7.72	642	23.6	2.33	27.0		grey-brown		22.5
1/6/23	~4L	7.71	663	15.5	3.26	37.1		grey-brown		21.6
~~3/6/23~~										
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Purged dry 3 times

WELL SAMPLING

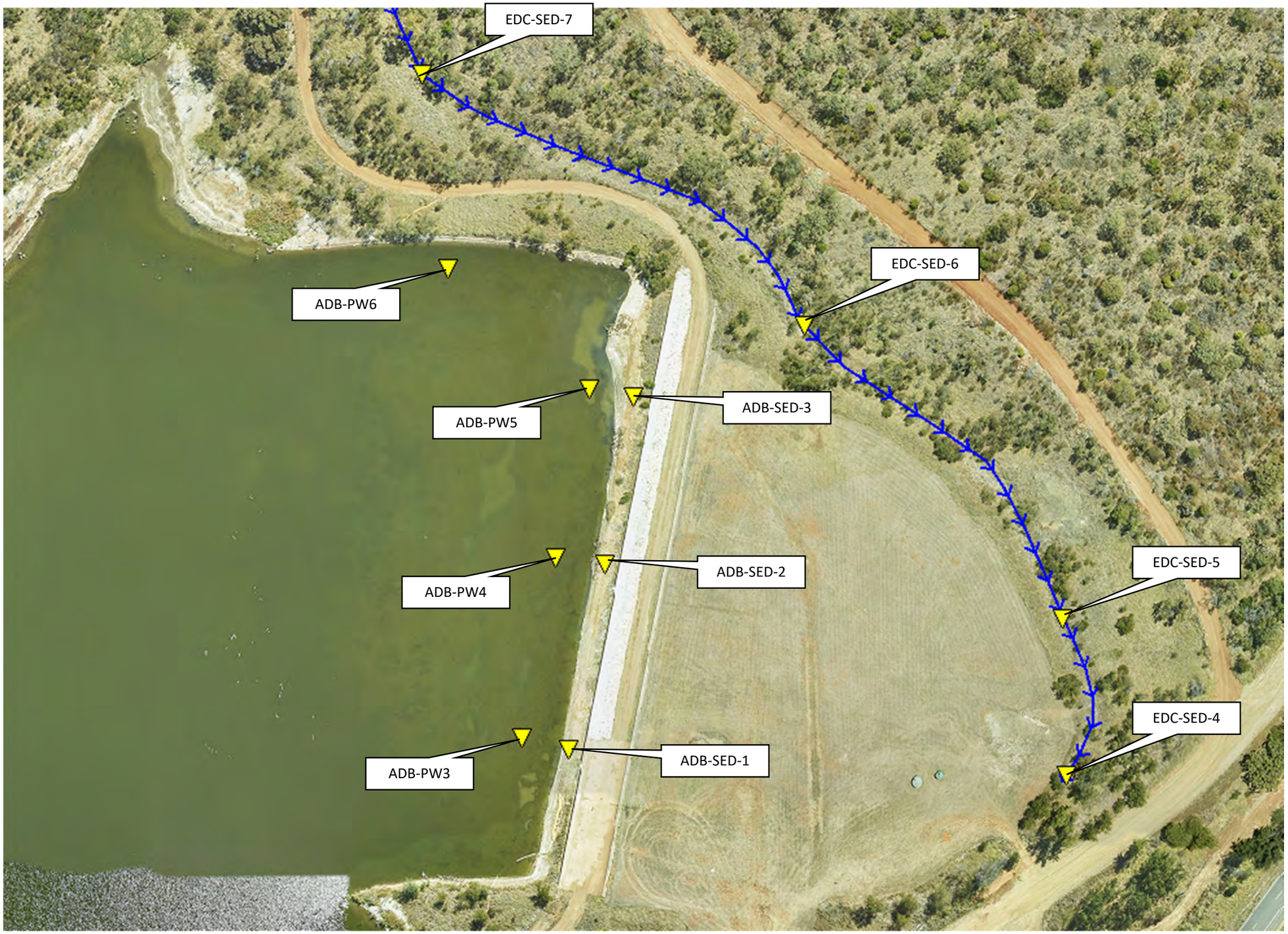
SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☒ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples					
Analysis/ Bottles					

Eastern Drainage Channel Sediment Sampling Notes – 11 Dec 2023

- Sampling completed by Dan Papinczak, with Sharon Geall (CS Energy) as secondary person for safety purposes regarding surface water sampling
- QC01/QC02 collected from EDC-SED-6
- ADB-PW3 to ADB-PW6 samples collected from Ash Dam B
- Borelogs not written up for surface soil samples, but have provided soil characteristics below:
- EDC-SED-1 to EDC-SED-3 were taken from the sediment along the shoreline of Ash Dam B, adjacent to the surface water sampling locations ADB PW3 to ADB PW5.
    - Sediment consisted of a moist/wet, grey, gravelly sandy clay, containing organic material (twigs, leaves) and small gravels
- EDC-SED-4 to EDC-SED-7 were taken along the eastern drainage channel.
    - EDC-SED-4 and EDC-SED-5 consisted of dry brown gravelly sand, with small to medium gravels
    - EDC-SED-6 consisted of a moist/wet, soft brown gravelly sandy clay with medium plasticity
    - EDC-SED-7 consisted of a dry, brown, medium dense sand with minor small gravels



Ash Dam B Spillway and Eastern Diversion Drain

Ash Dam B Surface Water Samples

ADB PW3

ADB PW4

ADB PW5

ADB PW6

Eastern Diversion Channel Samples:

EDC SED1

EDC SED2 etc`3`

APPENDIX H CALIBRATION CERTIFICATES

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003842-9003846 - INTERFACE METER

Plant Number: 235279

Probe Length: 60mt

ITEM	TEST	PASS	COMMENTS
Battery	Compartment / Capacity	☑	9v
Probe	Clean / Operation	☑	
Earth Lead	Check if equipped	☑	
Tape Check	Cleaned / Checked for cuts	☑	
Function test	At surface level	☑	

Note: Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Scott Crawford Date: 03 /04/ 23 Signed: S.

Accessories List:

Interface Meter	Tape Guide	Decon 90 Solution
Brush	Spare 9v Battery	Instruction Manual
Transport Box		

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003871 WATER QUALITY METER – MULTIFUNCTION

Plant Number: 1072254

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	393181 397396	☑
Conductivity	2.76 mS/cm @ 25°C	2.76 mS/cm		396172	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.0% in Sodium Sulphite	% Saturation in Air	12110	☑
ORP	240mV @ 25°C	240mV	-	398884/395163	☑

Battery Status 80 %	Temperature 19.2 °C
	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Scott Crawford Date: 26/05/23 Signed: S.

Accessories List:

User's Manual & USB	pH Sensor	Conductivity Sensor
Dissolved Oxygen Sensor with Wetting Cap	Redox (ORP) Sensor with Wetting Cap	Flow Cell 500ml
Comm Cable	Testing Cap	Storage Cap

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003871 WATER QUALITY METER – MULTIFUNCTION

Plant Number: 1100709

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	393181 397396	☑
Conductivity	2.76 mS/cm @ 25°C	2.76 mS/cm		396172	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.0% in Sodium Sulphite	% Saturation in Air	12110	☑
ORP	240mV @ 25°C	240mV	-	398884/395163	☑

Battery Status 100 %	Temperature 21 °C
	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: C.Lynch Date: 1/9/23 Signed: [signature]

Accessories List:

User's Manual & USB	pH Sensor	Conductivity Sensor
Dissolved Oxygen Sensor with Wetting Cap	Redox (ORP) Sensor with Wetting Cap	Flow Cell 500ml
Comm Cable	Testing Cap	Storage Cap

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003842-9003846 - INTERFACE METER

Plant Number: 235280

Probe Length: 60MT

ITEM	TEST	PASS	COMMENTS
Battery	Compartment / Capacity	☑	9v
Probe	Clean / Operation	☑	
Earth Lead	Check if equipped	☑	
Tape Check	Cleaned / Checked for cuts	☑	
Function test	At surface level	☑	

Note: Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Joshua Roy Date: 14/08/23 Signed: _____

Accessories List:

Interface Meter	Tape Guide	Decon 90 Solution
Brush	Spare 9v Battery	Instruction Manual
Transport Box		

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003842-9003846 - INTERFACE METER

Plant Number: 235280

Probe Length: 60

ITEM	TEST	PASS	COMMENTS
Battery	Compartment / Capacity	☑	9v
Probe	Clean / Operation	☑	
Earth Lead	Check if equipped	☑	
Tape Check	Cleaned / Checked for cuts	☑	
Function test	At surface level	☑	

Note: Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: M CUFFA Date: 10/02/23 Signed: _____

Accessories List:

Interface Meter	Tape Guide	Decon 90 Solution
Brush	Spare 9v Battery	Instruction Manual
Transport Box		

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003842-9003846 - INTERFACE METER

Plant Number: 235271

Probe Length: 60m

ITEM	TEST	PASS	COMMENTS
Battery	Compartment / Capacity	☑	9v
Probe	Clean / Operation	☑	
Earth Lead	Check if equipped	☑	
Tape Check	Cleaned / Checked for cuts	☑	
Function test	At surface level	☑	

Note: Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Scott Crawford Date: 01 / 12 / 23 Signed:

Accessories List:

Interface Meter	Tape Guide	Decon 90 Solution
Brush	Spare 9v Battery	Instruction Manual
Transport Box		

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003871 WATER QUALITY METER – MULTIFUNCTION

Plant Number: 10722555

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	377339 380327	☑
Conductivity	2.76 mS/cm @ 25°C	2.76 mS/cm		377099	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.0% in Sodium Sulphite	% Saturation in Air	12110	☑
ORP	240mV @ 25°C	240mV	-	7221	☑

Battery Status 90 %	Temperature 21 °C
	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: C. Lynch Date: 21/10/22 Signed: [signature]

Accessories List:

User's Manual & USB	pH Sensor	Conductivity Sensor
Dissolved Oxygen Sensor with Wetting Cap	Redox (ORP) Sensor with Wetting Cap	Flow Cell 500ml
Comm Cable	Testing Cap	Storage Cap

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003871 WATER QUALITY METER – MULTIFUNCTION

Plant Number: 1072178

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	377339 380327	☑
Conductivity	2.76 mS/cm @ 25°C	2.76 mS/cm		377099	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.0% in Sodium Sulphite	% Saturation in Air	12110	☑
ORP	240mV @ 25°C	240mV	-	398884/395163	☑

Battery Status 75 %	Temperature 19 °C
	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: M CUFFE Date: 24/02/23 Signed: _____

Accessories List:

User's Manual & USB	pH Sensor	Conductivity Sensor
Dissolved Oxygen Sensor with Wetting Cap	Redox (ORP) Sensor with Wetting Cap	Flow Cell 500ml
Comm Cable	Testing Cap	Storage Cap

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003871 WATER QUALITY METER – MULTIFUNCTION

Plant Number: 1079949

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	393181 397396	☑
Conductivity	2.76 mS/cm @ 25°C	2.76 mS/cm		396172	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.0% in Sodium Sulphite	% Saturation in Air	12110	☑
ORP	240mV @ 25°C	240mV	-	398884/395163	☑

Battery Status 90 %	Temperature 20 °C
	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: C. Lynch Date: 1/12/23 Signed: ChL

Accessories List:

User's Manual & USB	pH Sensor	Conductivity Sensor
Dissolved Oxygen Sensor with Wetting Cap	Redox (ORP) Sensor with Wetting Cap	Flow Cell 500ml
Comm Cable	Testing Cap	Storage Cap

APPENDIX I BORE LOGS

BOREHOLE LOG AD404

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD404-0.2		0	COAL SOOT - Black, with coal fines	D	VL		0
		AD404-0.5		0.5	ASH - Grey, coarse		L		0.5
				1					1
		AD404-1.5		1.5	COAL SOOT - Black, with coal fines		VL		1.5
					ASH - Grey, coarse		L		
				2					2
				2.5					2.5
		AD404-3.0		3	PEAT - Black, with rootlets	M			3
				3.5	ASH - Grey, fine				3.5
					ASH - Grey, coarse				
	▽	AD404-4.0		4	ASH - Grey, saturated	W	VS		4
				4.5	ASH - Grey, coarse	M	L		4.5
SFA				5					5
				5.5	ASH - Grey, saturated	W	S		5.5
		AD404-6.0		6					6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
				9					9
				9.5	GRAVELLY CLAY - Grey and green, coarse gravels	M	St	BD01_3005/SD01_3005 taken at 10.0 mbgl	9.5
		AD404-10.0		10					10
					EOH @ 10.0 mbgl - Target Depth				
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD405

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD405-0.2		0	COAL SOOT - Black, with coal fines	D	VL		0
		AD405-0.5		0.5	ASH - Grey, coarse		L		0.5
				1					1
		AD405-1.5		1.5	COAL SOOT - Black, with coal fines		VL		1.5
				2	ASH - Grey, coarse, trace brown gravel (med-coarse)	M	L		2
				2.5	PEAT - Black, with rootlets (5%)				2.5
		AD405-3.0		3					3
				3.5	ASH - Grey, coarse				3.5
	▽	AD405-4.0		4					4
				4.5	ASH - Grey, saturated	W	S		4.5
SFA				5	ASH - Grey, coarse		L		5
				5.5					5.5
		AD405-6.0		6					6
				6.5					6.5
				7	ASH - Grey, saturated		S		7
				7.5					7.5
				8					8
				8.5					8.5
		AD405-9.0		9					9
				9.5	CLAY - Brown, low to medium plasticity	M	St		9.5
				10					10
				10.5	EOH @ 10.0 mbgl - Target depth				10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD406

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 9 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD406-0.2		0	ASH - Grey, fine	D	VL		0
		AD406-0.5		0.5					0.5
		AD406-1.0		1					1
				1.5					1.5
		AD406-2.0		2					2
				2.5					2.5
		AD406-3.0		3					3
				3.5					3.5
				4					4
	▽	AD406-4.5		4.5	ASH - Grey, coarse	W	L		4.5
SFA		AD406-5.0		5					5
				5.5					5.5
		AD406-6.0		6					6
				6.5					6.5
		AD406-7.0		7					7
				7.5					7.5
		AD406-8.0		8	ASH - Grey, clayey, saturated		VS		8
				8.5	CLAY - Brown, medium plasticity		S		8.5
				9	EOH @ 9.0 mbgl - Target depth				9
				9.5					9.5
				10					10
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD407

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD407-0.2		0	ASH - Grey, fine	D	VL		0
		AD407-0.5		0.5					0.5
		AD407-1.0		1					1
				1.5					1.5
		AD407-2.0		2					2
				2.5					2.5
		AD407-3.0		3	ASH - Grey, fine, clayey		L		3
				3.5	ASH - Grey, coarse	M			3.5
		AD407-4.0		4					4
				4.5					4.5
SFA				5					5
				5.5					5.5
		AD407-6.0		6					6
				6.5					6.5
				7					7
				7.5					7.5
		AD407-8.0		8					8
				8.5	CLAY - Grey and brown, soft to stiff, medium plasticity		St		8.5
		AD407-9.0		9					9
				9.5					9.5
				10					10
				10.5	EOH @ 10.0 mbgl - Target depth				10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD408

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD408-0.2		0	ASH - Grey, coarse, with medium to coarse subrounded gravels	D	L		0
		AD408-0.5		0.5	ASH - Grey, coarse				0.5
				1					1
				1.5					1.5
		AD408-2.0		2	ASH - Grey		VL		2
		AD408-2.7		2.5					2.5
				3	COAL SOOT - Black		L		3
				3.5	ASH - Grey, coarse, with medium to coarse subrounded gravels				3.5
		AD408-4.0		4	COAL SOOT - Black				4
				4.5	ASH - Grey, coarse	M			4.5
SFA				5					5
				5.5					5.5
		AD408-6.0		6					6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
	▽			9	CLAY - Brown, with fine gravels, medium plasticity	W	S		9
				9.5					9.5
		AD408-10.0		10					10
				10.5	EOH @ 10.0 mbgl - Target depth				10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD409

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 4.8 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD409-0.5		0.5	ROAD BASE - Gravelly Sand	D	L		0.5
		AD409-1.1		1	ASH - Grey, coarse				1
				1.5	ASH - Grey, fine, clayey				1.5
	▽	AD409-2.0		2	GRAVELLY SAND - Brown and black, with medium to coarse gravels				2
				2.5	ASH - Grey, fine, clayey	W	S		2.5
		AD409-3.0		3		D	L		3
		AD409-3.5		3.5		W	S		3.5
				4	SILTY CLAY - Grey, high plasticity	M		Natural at 3.4 mbgl	4
				4.5	GRAVELLY CLAY - Green and grey, fine to medium gravels				4.5
				5	EOH @ 4.8 mbgl - Target Depth				5
				5.5					5.5
				6					6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
				9					9
				9.5					9.5
				10					10
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD410

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 6 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD410-0.5		0.5	ROAD BASE - Black, gravelly sand	D	L		0.5
					ASH - Grey, coarse				
		AD410-1.0		1					1
				1.5	COAL SOOT - Black				1.5
					ASH - Grey, fine, clayey				
		AD410-2.0		2	ASH - Dark Grey, fine, clayey				2
				2.5	COAL SOOT - Black		VL		2.5
	▽	AD410-3.1		3	ASH - Grey, fine	W	L		3
				3.5	ASH - Grey, coarse	D M			3.5
		AD410-4.0		4		W	S		4
				4.5					4.5
SFA				5					5
				5.5					5.5
		AD410-6.0		6					6
				6	EOH @ 6.0 mbgl - Refusal on rock				6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
				9					9
				9.5					9.5
				10					10
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD411

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 8 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD411-0.5		0.5	ASH - Grey, coarse, with medium to coarse gravels	D	L	coarse gravel to cobbles at 0.0 - 0.1 mbgl	0.5
		AD411-1.0		1				BD03_3105/SD03_3105 taken at 1.0 mbgl	1
				1.5					1.5
				2					2
				2.5	Same as above, but a darker grey with fewer gravels				2.5
		AD411-3.0		3	ASH - Grey, fine		VL		3
				3.5					3.5
				4	ASH - Grey, coarse with fine gravels		L		4
				4.5					4.5
SFA				5					5
				5.5	ASH - Grey, fine, clayey		MD		5.5
				6					6
				6.5					6.5
		AD411-7.0		7					7
				7.5					7.5
				8					8
				8.5	EOH @ 8.0 mbgl - Refusal on rock				8.5
				9					9
				9.5					9.5
				10					10
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD412

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 4.8 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD412-0.5		0.5	ROAD BASE	D	L		0.5
					COAL SOOT - Black				
		AD412-1.0		1	ASH - Grey, fine				1
					FILL - Gravelly clay, brown		St		
				1.5	COAL SOOT - Black		L		1.5
		AD412-2.0		2	FILL - Gravelly clay, light brown, fine to medium gravel		S		2
				2.5			St		2.5
		AD412-3.0		3	COAL SOOT - Black		L		3
					FILL - Gravelly clay, light brown		St		
				3.5					3.5
				4	GRAVELLY CLAY - Green and brown, medium to coarse gravels, low to medium plasticity				4
				4.5					4.5
				5	EOH @ 4.8 mbgl - Target depth				5
				5.5					5.5
				6					6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
				9					9
				9.5					9.5
				10					10
				10.5					10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

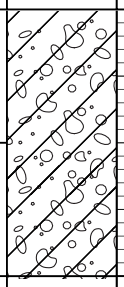
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BOREHOLE LOG AD413

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 0.2 mbgl
DIAMETER:
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
		AD413-0.2		0.05 0.1 0.15 0.2	GRAVELLY CLAY - Brown, fine to coarse gravel, with rootlets (5%), non plastic	D	St	Sample collected with shovel, inaccessible with drill rig	0.05 0.1 0.15 0.2
				0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85 0.9 0.95	EOH @ 0.2 mbgl - Surface sample				0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85 0.9 0.95

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD414

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD414-0.2		0	ASH - Grey, coarse, trace brown gravel (fine to medium)	D	L	The trace gravel is highly porous rock	0
		AD414-0.5		0.5					0.5
				1					1
				1.5	COAL SOOT - Black				1.5
		AD414-2.0		2	ASH - Grey, coarse			BD02_3005/SD02_3005 taken here	2
				2.5					2.5
				3					3
				3.5					3.5
	▽			4	PEAT - Black, trace rootlets	M			4
		AD414-4.5		4.5	ASH - Grey, coarse	W			4.5
SFA				5					5
				5.5	ASH - Grey, fine				5.5
		AD414-6.0		6					6
				6.5					6.5
				7					7
				7.5					7.5
				8					8
				8.5					8.5
				9					9
				9.5					9.5
		AD414-10.0		10					10
				10.5	EOH @ 10.0 mbgl - Target depth				10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG AD415

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 30 May 2023
TOTAL DEPTH: 10 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		AD415-0.2		0	ASH - Grey, fine	D	VL		0
				0.5					0.5
		AD415-1.0		1					1
				1.5					1.5
		AD415-2.0		2					2
				2.5	ASH - Grey, fine, clayey	M	MD		2.5
		AD415-3.0		3					3
				3.5	ASH - Grey, fine		VL		3.5
	▽			4					4
		AD415-4.5		4.5	ASH - Grey, fine, saturated	W	VS		4.5
SFA				5	ASH - Black and grey, coarse		L		5
				5.5					5.5
		AD415-6.0		6					6
				6.5					6.5
				7					7
				7.5					7.5
		AD415-8.0		8					8
				8.5					8.5
				9					9
				9.5					9.5
				10					10
				10.5	EOH @ 10.0 mbgl - Target depth				10.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG CA17

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 1.4 mbgl
DIAMETER: 50 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		CA17-0.2		0.1	COAL SOOT - Black	D	VL		0.1
				0.2					0.2
				0.3					0.3
				0.4					0.4
				0.5					0.5
				0.6					0.6
		CA17-0.7		0.7	SANDY CLAY - Brown, medium to coarse grained, low plasticity		St		0.7
				0.8					0.8
				0.9					0.9
				1	SANDY CLAY - White, with brown mottle				1
SFA				1.1					1.1
				1.2					1.2
		CA17-1.4		1.3					1.3
				1.4	EOH @ 1.4 mbgl - Refusal on rock				1.4
				1.5					1.5
				1.6					1.6
				1.7					1.7
				1.8					1.8
				1.9					1.9

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG CA18

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 1.8 mbgl
DIAMETER: 50 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT				0.1	COAL SOOT - Black	D	VL		0.1
				0.2					0.2
				0.3					0.3
				0.4					0.4
		CA18-0.5		0.5					0.5
				0.6					0.6
				0.7					0.7
				0.8	GRAVELLY CLAY - light brown, with medium to coarse gravel		St		0.8
				0.9					0.9
		CA18-1.0		1					1
				1.1					1.1
SFA				1.2					1.2
				1.3	SANDY CLAY - Brown, medium plasticity	M	F		1.3
				1.4					1.4
				1.5					1.5
				1.6					1.6
				1.7					1.7
		CA18-1.8		1.8					1.8
				1.9	EOH @ 1.8 mbgl - Refusal on rock				1.9

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG CA19

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 31 May 2023
TOTAL DEPTH: 1.3 mbgl
DIAMETER: 50 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING:
NORTHING:
COORDINATE SYSTEM:

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT				0.1	COAL SOOT - Black	D	VL		0.1
		CA19-0.2		0.2					0.2
				0.3					0.3
				0.4	WEATHERED ROCK - red and white, fine grained				0.4
		CA19-0.6		0.5	GRAVELLY SAND - Fine grained, fine to medium gravels		D		0.5
				0.6					0.6
				0.7					0.7
				0.8					0.8
				0.9					0.9
				1					1
SFA		CA19-1.2		1.1	SANDY CLAY - Brown, low plasticity, trace gravel		St		1.1
				1.2					1.2
				1.3	EOH @ 1.3 mbgl - Refusal on rock				1.3
				1.4					1.4
				1.5					1.5
				1.6					1.6
				1.7					1.7
				1.8					1.8
				1.9					1.9

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: ADB02**
Project Manager: MCK	**Date:** 29/06
Location: WCF	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: -	**Bore Diameter:** 60 mm
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		ADB02_0.0	SOIL				CLAY - yellow with angular andesite gravels (20%, 2-40mm)	M	S	BD/SD12 @ 0.0 m
		ADB02_0.2	SOIL				CLAY - brown		F	
		ADB02_0.3	SOIL				SANDY CLAY - brown with sand reducing down hole	H	St	
1	1	ADB02_1.0	SOIL				CLAY - grey with white-grey-brown sandy includions and angular gravels	M	S	
		ADB02_1.5	SOIL				CLAY - white-brown (ex. weathered rock fractured) grey clay present surrounding roots	D		Boundary marked by gravel (angular band with rootlets @ 1.2 mBGL weathered rocky band meets boundary of natural
2	2	ADB02_2.0	SOIL							
		ADB02_2.5	SOIL							
							EOH @ 2.7 m, target depth			
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: ADB03**
Project Manager: MCK	**Date:** 29/06/22
Location: WCF	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: -	**Bore Diameter:** 60 mm
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		ADB03_0.0	SOIL				REWORKED: - clay, dark brown with angular gravels	D	Fb	BD/SD10 @ 0.0 m
		ADB03_0.2	SOIL				REWORKED: - sandy clay, brown with angular gravels decreasing in abundance downhole (30%, 2-30mm)		S	
		ADB03_0.5	SOIL				CLAY - brown with subangular gravels		H	
1	1	ADB03_1.0	SOIL				CLAY - dark brown with rounded gravels (<5%)			
		ADB03_1.5	SOIL							
2	2	ADB03_2.0	SOIL				EOH @ 2.0 m, target depth			
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: ADB01**
Project Manager: MCK	**Date:** 29/06/22
Location: WCF	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: -	**Bore Diameter:** 60 mm
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		ADB01_0.0	SOIL				CLAYEY SAND: - dark brown with roots (10%, 2-5mm)	D	MD	
		ADB01_0.2	SOIL				GRAVELLY SAND - brown with subangular gravels (30%, 2-20mm)			
		ADB01_0.5	SOIL							
1	1	ADB01_1.0	SOIL				CLAY - dark brown		VD H	
		ADB01_1.5	SOIL				SANDY CLAY -brown, fine grained		Fb	
2	2	ADB01_2.0	SOIL						H	
		ADB01_2.5	SOIL							
3	3	ADB01_3.0	SOIL							
		ADB01_3.5	SOIL				GRAVELLY CLAY: extremely weathered andesite			
4	4	ADB01_4.0	SOIL				EOH @ 4.0m, invert of nearby creek			
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: ADB05**
Project Manager: MCK	**Date:** 29/06/22
Location: WCF	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: -	**Bore Diameter:** 60 mm
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		ADB05_0.0	SOIL				CLAY - brown with reeds and roots (10%)	M	VS	BD/SD09 @ 0.0 m
		ADB05_0.2	SOIL				CLAY - dark brown with rounded gravels (10%, 2-10mm)	H		
		ADB05_0.5	SOIL					D	F	
								H	St	
1	1	ADB05_1.0	SOIL				CLAY - brown with weathered rock bands		H	
		ADB05_1.5	SOIL						VSt	
2	2	ADB05_2.0	SOIL				weathered andesite EOH @ 2.0 mBGL - target depth			
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: ADB04**
Project Manager: MCK	**Date:** 29/06/22
Location: WCF	
Client: CS Energy	**Drilled By:** -
Surface Elevation: -	**Bore Diameter:** -
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		ADB04_0.0	SOIL				REWORKED: -clay, brown with rounded gravels (10%, 2-10mm)	M	F	Reworked
		ADB04_0.2	SOIL				CLAY - dark brown with fine to medium grained sand lenses (10%)		St/ VSt	
		ADB04_0.5	SOIL					D		
1	1	ADB04_1.0	SOIL							
		ADB04_1.5	SOIL							
2	2	ADB04_2.0	SOIL				EOH @ 2.0 mBGL - target depth			
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: AD1.2 (pg.1)**
Project Manager: MCK	**Date:** 29/6
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: -	**Bore Diameter:** 60 mm
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0	AD1.2_0.0					FILL: - grey ash with white grains (<5%) and rootlets (<5%, 1-2mm)	D	MD	Compressed in PT
		AD1.2_0.5							L	
1	1	AD1.2_1.0								
		AD1.2_1.5					FILL: - grey ash with white grains, alternating lamina of dark grey ash and rare coal gravels lamina of light grey ash increasing in abundance downhole			
2	2	AD1.2_2.0							MD	
		AD1.2_2.5					FILL: - ash, dark grey with white gravels (5%) and light grey ash laminae (10%)		L	
		AD1.2_2.8								
3	3	AD1.2_3.0					FILL: - ash, light grey with rare dark grey ash laminae			
		AD1.2_3.5							MD	
4	4	AD1.2_4.0					FILL: - ash, dark grey with white gravels and rare light grey ash laminae		D	
		AD1.2_4.5							D	
5	5	AD1.2_5.0					FILL: - ash, light grey with rare dark grey laminae which are increasing in abundance downhole		S	
		AD1.2_5.5								
6	6	AD1.2_6.0					FILL: - ash, light grey with rare brown sandy clay lenses		VSt	Reworked
		AD1.2_6.5								
7	7	AD1.2_7.0					FILL: - ash, dark grey with light grey laminae and rounded red gravels (10%, 1-2mm) present in dark grey bands			Reworked
										Poor recovery, no sample
8	8						SANDY CLAY - dark brown with angular gravels (10%, 2-10mm) lightening downhole			
9	9						CLAY - dark brown clay with angular gravels (10%, 2-5mmpoorly sorted)			
10	10						CLAYEY SAND - light brown with rounded gravels (10%, 1-5mm)			
11	11						EOH @ 8.8 mBGL - target depth			

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID) Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA15**
Project Manager: MCK	**Date:** 28/06/22
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: -	**Bore Diameter:** 60 mm
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA15_0.0	SOIL				FILL: - alternating lamane of grey clayey ash and black coaly clay	H	D	Samples were predominately coal
		CA15_0.5	SOIL							
1	1	CA15_1.0	SOIL				REWORKED: -gravelly clay, dark brown with rounded gravels (25%, 5-10mm)		F	
							Refusal @ 1.2m on rock			
2	2									
3	3									
4	4									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA01**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT-> SFA
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA01_0.0	SOIL				FILL: -clayey sand, dark brown with bark (10%, 2-20mm)	D	D	Roots mark boundary between clayey sand and clay
								D	VSt	
		CA01_0.5	SOIL				FILL: -clay, light brown			
							SANDY CLAY: -light brown, with weathered volcanics	D	F	
1	1	CA01_1.0	SOIL				Refusal @ 1m on hard surface, no returns (likely rock)			
2	2									
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA02**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** Soil Tech
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA02_0.0	SOIL				FILL: -gravelly sand, grey with fine sand to pebble sized rock fragments (25%)	D H D	VL L	
		CA02_0.5	SOIL				FILL: -coarse sand, bown with angular gravels	D	MD F	
							FILL: -clayey gravel, brown Subangular	D		PT refusal at 0.4m, swapped to SFA
		CA02_1.0	SOIL				FILL: -clayey sand, brown with subangular gravels (20%, 2-30mm			
1	1						SANDY CLAY: -light brown with increasing sand content downhole			
2	2						Refusal @ 1.6m on solid surface, no returns			
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA03**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** SFA
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA03_0.0	SOIL				FILL: -sandy clay, light brown with angular gravels to pebbles (20% 2-40mm)	D	St	
		CA03_0.5	SOIL				SANDY CLAY: -light brown	D	VSt	
							Refusal @ 0.6m on hard surface, no returns			
1	1									
2	2									
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA14**
Project Manager: MCK	**Date:** 28/6/22
Location: Callide A	
Client: CS Energy	**Drilled By:** SFA
Surface Elevation: -	**Bore Diameter:** -
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA14_0.0	SOIL				FILL: -stony coal	D	MD	
							Weathered Volcanics		ROCK	
							Refusal @ 0.2 m on rock			
1	1									
2	2									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: AD401**
Project Manager: MCK	**Date:** 30/06/2022
Location: AD4	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		AD401_0.0	SOIL				FILL: -Coal fragments coarse grain to gravel	D	VL	BD/SD18 collected @ 0.0m
		AD401_0.2	SOIL						L	
		AD401_0.5	SOIL				FILL: -ash, dark grey with gravels (20%, 1-3mm)		MD	
		AD401_0.8	SOIL				FILL: -ash, grey with angular gravels (10%, 3-10mm)		L	
1	1	AD401_1.0	SOIL							
		AD401_1.2	SOIL				FILL: -ash, dark grey angular gravels (40%, 3-15mm)			
		AD401-1.5	SOIL				FILL: -ash, grey with angular gravels (10%, 3-10mm)			
							FILL: -stoney coal fragments, pebble		S	
2	2	AD401_2.0	SOIL				FILL: -ash, grey with angular gravels (10%, 2-10mm)			
		AD401_2.5	SOIL				FILL: -clay, black, carbonaceous	H		
								M		
							FILL: -ash, grey		MD	
3	3	AD401_3.0	SOIL					W	D	
		AD401_3.5	SOIL					M	MD	
									D	
4	4	AD401_4.0	SOIL							
		AD401_4.5	SOIL							
5	5	AD401_5.0	SOIL							Swapped to SFA at 5m

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: AD401**
Project Manager: MCK	**Date:** 30/06/2022
Location: AD4	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		AD401_5.5	SOIL							
		AD401_6.0	SOIL							
6	6									
		AD401_6.5	SOIL							
		AD401_7.0	SOIL							
7	7									
		AD401_7.5	SOIL							
		AD401_8.0	SOIL							
8	8							M	VD	
		AD401_8.5	SOIL				SANDY CLAY: -brown with angular gravels (20%, 2-10mm) and Grey clay inclusions (10%)	H		
		AD401_9.0	SOIL				CLAY: -grey with dark brown mottle (~10%)		VSt	Slightly green, natural at 9m
9	9									
		AD401_9.5	SOIL							Strong H2S, odour when broken
		AD401_10.0	SOIL							
10	10									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: AD401**
Project Manager: MCK	**Date:** 30/06/2022
Location: AD4	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
							EOH @ 10.0m, limit of investigation			

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: AD402**
Project Manager: MCK	**Date:** 30/06/2022
Location: AD4	
Client: CS Energy	**Drilled By:** PT->SFA
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		AD402_0.0	SOIL				FILL: -ash, dark grey with clay inclusions (10%)	VD	VL	
		AD402_0.2	SOIL							
		AD402_0.5	SOIL							
1	1	AD402_1.0	SOIL				FILL: -ash, grey with white grains (10%, <1mm)		L	
		AD402_1.5	SOIL							
2	2	AD402_2.0	SOIL				FILL: -ash, dark grey with gravels (20%)			Bottom Ash
		AD402_2.5	SOIL							
3	3	AD402_3.0	SOIL							
		AD402_3.5	SOIL							
4	4	AD402_4.0	SOIL					M W	MD	
		AD402_4.5	SOIL							
							No recovery	M		May have washed out
5	5						FILL: -ash, dark grey with clay (20-30%)		MD	
6	6	AD402_6.0	SOIL							
		AD402_6.5	SOIL							
							FILL: -ash, light grey	M	MD	
7	7	AD402_7.0	SOIL							
		AD402_7.5	SOIL							
8	8	AD402_8.0	SOIL							
		AD402_8.5	SOIL							
9	9	AD402_9.0	SOIL							
		AD402_9.5	SOIL							
10	10	AD402_10.0	SOIL							

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: AD403**
Project Manager: MCK	**Date:** 30/06/2022
Location: AD4	
Client: CS Energy	**Drilled By:** SFA
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0	AD403_0.0 AD403_0.2 AD403_0.5					FILL: -ash, dark grey with slag (20-30%, 2-10mm)	D	L	
1	1	AD403_1.0 AD403_1.5								
2	2	AD403_2.0 AD403_2.5								
3	3	AD403_3.0 AD403_3.5						M	MD	
4	4	AD403_4.0 AD403_4.5								
5	5	AD403_5.0 AD403_5.5								Minimal returns on auger stem 5-7 m
6	6	AD403_6.0								
7	7									
8	8									
9	9						FILL: -ash, grey	W		
10	10						EOH @ 10m, limit of investigation			
11	11									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA04**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA04_0.0	SOIL				REWORKED: -sandy clay, dark brown with light brown fine grained sand inclusions (10%)	D	S	
		CA04_0.3	SOIL					H	F	
		CA04_0.5	SOIL				REWORKED: -sandy clay, dark brown with light brown sandy inclusions (10%)	D	D	
1	1	CA04_1.0	SOIL				CLAYEY SAND: -light brown with extremely weathered rock bands increasing in abundance downhole	D	VD	
							Refusal @ 1.5m, refusal on rock			
2	2									
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA05**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA05_0.0	SOIL				FILL: -sandy clay, dark brown with angular gravels (10%, 2-20mm)	D	S	
		CA05_0.4	SOIL				FILL: -clay, light brown with rounded gravels (10%, 2-5mm)			0.5-1.0 m lost, redrilled and recovered
1	1	CA05_1.0	SOIL				CLAY: -light brown with weathered rock			
							Refusal @ 1.2, refusal on rock			
2	2									
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA06**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA06_0.0	SOIL				FILL: -ash, grey with angular gravels of coal	D	VL	
							FILL: -clayey sand, dark brown with angular gravels (20%, 3-40mm)	H	D	Located next to stockpile of bottom ash Swapped to SFA due to core loss >80%
		CA06_0.5	SOIL							
		CA06_1.0	SOIL				As above but with stiff clay inclusions (10%)	D	L	
1	1						As above but without clay inclusions			
		CA06_1.5	SOIL				As above but with ash inclusions (10%)		MD	
									L	
		CA06_2.0	SOIL							
2	2									
		CA06_2.5	SOIL					M		
							As above, with increasing abundance of gravels downhole	W		
		CA06_3.0	SOIL							
3	3						Refusal @ 3.2m, no recovery			
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA07**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA07_0.0	SOIL				FILL: -sandy clay, dark brown with fine grained sand inclusion (10%)	D	VS	No recovery after 0.2, swapped to SFA
							No recovery			
							FILL: -sandy clay, dark brown with fine grained sand decreasing in abundance downhole	H	S	
1	1	CA07_1.0	SOIL							
							Weathered light brown rock	D	Rock	
		CA07_1.2	SOIL							
							Refusal @ 1.2m on rock			
2	2									
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA08**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA08_0.0	SOIL				FILL: -sandy clay, dark brown with angular gravels (20%, 3-50mm) decreasing in abundacnce downhole	D	St	Location moved immediately west of stormwater drain due to access restriction
		CA08_0.4	SOIL							
		CA08_0.6	SOIL							Coal fragments @ 0.5m
							CLAY: -red		VD	
1	1	CA08_1.0	SOIL				CLAYEY SAND: -light brown			Extremely weathered rock
							Refusal @ 1.2m on rock			
2	2									
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA09**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** STA
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA09_0.0	SOIL				FILL: -gravely clayey sand, dark brown with rootlets and angular pebbles (10%)	D	L	
		CA09_0.5	SOIL							
		CA09_0.8	SOIL							
1	1						CLAYEY SAND: -light brown	H		
		CA09_1.2	SOIL							
							Refusal @ 1.2m on rock			
2	2									
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA10**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0	CA10_0.0	SOIL				REWORKED: -sandy clay, brown with rounded gravels (25%)	D	VSt	BD/SD03 @ 0.0
							Refusal @ 0.3m on rock			
1	1									
2	2									
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA11**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA11_0.0	SOIL				SANDY CLAY: -brown with rounded gravels (25%)	M	St	Rock outcrop immediately adjacent to location
							Refusal @ 0.3m on rock			
1	1									
2	2									
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA12**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA12_0.0	SOIL				FILL: -stony coal	D	VL	
		CA12_0.5	SOIL				FILL: -sandy clay, light brown with angular gravels (40%, 3-50mm)	D	MD	
1	1	CA12_1.0	SOIL				No recovery			
		CA12_1.5	SOIL				FILL: -stony coal	D	VL	
							REOWRKED: -Clay, red with subangular gravels (30%, 2-10mm)		F	Reworked material possibly associated with reclaim hopper
2	2	CA12_2.0	SOIL							
		CA12_2.5	SOIL							
3	3	CA12_3.0	SOIL							
		CA12_3.5	SOIL							
							SANDY CLAY: -light brown		St	
4	4	CA12_4.0	SOIL				Refusal @ 4m on rock			
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA13**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		CA13_0.0	SOIL				FILL: -stony coal	D	S	BD/SD04 @ 0.0 Shallow PT refused, swap to SFA @ 0.2m
		CA13_0.5	SOIL				SANDY CLAY: -light brown			
		CA13_1.0	SOIL				Refusal @ 1.5m, on rock			

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: CA16**
Project Manager: MCK	**Date:** 28/06/2022
Location: Callide A	
Client: CS Energy	**Drilled By:** PT/SFA
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
							Asphalt	H	MD	
		CA16_0.0	SOIL				FILL: -clayey gravely sand, dark brown with fine grained sandy inclusions			Refusal of PT, swap to SFA @ 0.3m
		CA16_0.3	SOIL				Refusal @ 0.3m, no returns			
1	1									
2	2									
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: ADB06**
Project Manager: MCK	**Date:** 29/06/2022
Location: WCF	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: 0	**Bore Diameter:**
Latitude:	**Longitude:**

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		ADB06_0.0	SOIL				CLAY: -dark brown	H	St	Plowed
		ADB06_0.2	SOIL						H	
							CLAY: -dark brown	D		
		ADB06_0.5	SOIL							
							CLAY: -brown with rounded gravels (<5%, 1-5mm)			
1	1	ADB06_1.0	SOIL							
		ADB06_1.5	SOIL							
							CLAY: - weathered andersite			
2	2	ADB06_2.0	SOIL				EOH @ 2m, target depth			
3	3									
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: AD2-1**
Project Manager: MCK	**Date:** 29/6/22
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: -	**Bore Diameter:** -
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		AD2-1_0.0	SOIL				FILL: sandy clay, dark brown with rounded gravels (<5%, 3-5mm) and rootlets (1.5%, 1-2mm)	D	VSt	
							FILL: - ash, dark grey with fine white gravels (<5%)		MD	Core compressed, likley coal resulting in core loss
		AD2-1_0.5	SOIL						L	
		AD2-1_0.6	SOIL				FILL: - coal fragments (2-20mm)		MD	
		AD2-1_0.8	SOIL				FILL: - ash, light grey with rootlets (10%, 1-2mm)			Reworked
		AD2-1_1.0	SOIL				GRAVELLY SAND - light brown, fine to coarse gravels moderately sorted		L	Refusal on PT, swapped to SFA
1	1						EOH @ 1.2 mBGL - refusal on rock			
2	2									
3	3									
4	4									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: AD2-2**
Project Manager: MCK	**Date:** 29/6/22
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: -	**Bore Diameter:** 60 mm
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		AD2-2_0.0	SOIL				FILL: - clay, dark brown with rounded gravels (<5%, 3-5mm) and rootlets (10%, 1-3mm)	D	St MD	
		AD2-2_0.5	SOIL				FILL: - ash, dark grey			
							FILL: - ash, light grey			
1	1	AD2-2_1.0	SOIL				FILL: - ash, dark grey with white grains (<5%, <1mm)	D/H	L	BD/SD05 @ 1.0 mBGL
		AD2-2_1.2	SOIL				FILL: - clay, dark brown with rounded gravels (<5%, 2-5mm)	D	MD	
		AD2-2_1.5	SOIL				FILL: - ash, light grey		D	
2	2	AD2-2_2.0	SOIL							
		AD2-2_2.5	SOIL				FILL: - ash, light grey with white grains (<5%, <1mm)	M W		
		AD2-2_2.6	SOIL						VD	
		AD2-2_2.8	SOIL					M	S	
3	3	AD2-2_3.0	SOIL				FILL -clay, brown with subangular gravels (10%, 2-10mm) and sand (fine-coarse, poorly sorted) layers	H D	St D VD	Coarse, well-sorted green/brown sand layer marks base of unit Undulating boundary
		AD2-2_3.1	SOIL							
		AD2-2_3.4	SOIL				FILL: - ash, dark grey, with white fine grains (<5%)			Attempted SFA, refusal
4	4						CLAYEY SAND - light brown, fine and well sorted			
							EOH @ 3.4 mBGL - refusal on rock (quartz fragment returns)			
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG REPORT

Level 6, 193 North Quay
Brisbane Qld 4000
Tel: 1800 779 363

Project Number: BC200153.02	**Borehole Number: AD1-1**
Project Manager: MCK	**Date:** 29/06/22
Location: Callide A	
Client: CS Energy	**Drilled By:** PT
Surface Elevation: -	**Bore Diameter:** 60 mm
Latitude: -	**Longitude:** -

DRILLING DATA					MATERIAL DATA					
WATER	DEPTH (m)	SAMPLE ID	SAMPLE TYPE	PID RESULTS	GRAPHIC LOG	USC CLASS	DESCRIPTION Soil division: sand/gravel/clay, grading, weathering, plasticity, colour, other components.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
		AD1.1_0.0	SOIL				FILL: - brown with rootlets (10%, 2mm)	D	S	BD/SD08 @ 0.0 mBGL
							FILL: - ash, grey		MD	
		AD1.1_0.5	SOIL				FILL: - ash, light grey with grey ash laminae		D	Thin veneer of light grey ash
1	1	AD1.1_1.0	SOIL						L	
		AD1.1_1.5	SOIL						MD	
									MD	
2	2	AD1.1_2.0	SOIL				FILL: - ash, dark grey laminae			
		AD1.1_2.5	SOIL				CLAYEY SAND - light brown with rounded gravels, extremely weathered rock			
3	3	AD1.1_2.9	SOIL				EOH @ 2.9 mBGL - refusal on rock			
4	4									
5	5									

Moisture
D: Dry, M: Moist, W:Wet

Consitency Index
VS:Very Soft, St:Stiff, S:Soft, VSt:Very Stiff

Density Index
VL:Very Loose, D:Dense, L:Loose, VD:Very Dense, MD:Medium Dense

Sample Type
E: Environmental, D: Disturbed
B: Bulk, W: Water

Descriptions based on Unified Soil Classification system.
Photo Ionisation Detector (PID)
Parts per million (ppm)

BOREHOLE LOG MW95

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 5.5 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259312.57
NORTHING: 7306981.00
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		MW95-0.2		0	FILL - Gravelly clay, brown, with fine to medium gravels	D	VSt		0
				0.5	FILL - Gravelly sand, brown, with medium to coarse gravel		VL		0.5
		MW95-1.0		1	COAL SOOT - Black				1
					FILL - Sandy gravel, white subangular gravels with brown medium grained sand, mild weathering		H		
		MW95-2.0		1.5					1.5
				2	ASH - Grey, fine		VL		2
				2.5					2.5
				3					3
				3.5					3.5
SFA					FILL - Sandy gravel, white subangular gravels with brown medium grained sand, mild weathering		H	Other assorted rocks also present in fill material	
		MW95-4.0		4					4
				4.5					4.5
				5				Gravelly, ashy fill material makes well installation not feasible	5
				5.5	EOH @ 5.5 mbgl - Refusal on fill				5.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG MW95#2

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 3.0 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259314.40
NORTHING: 7306963.41
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
SFA				0	COAL SOOT - Black	D	VL		0
				0.5	CLAY - Brown, with medium to coarse gravels, medium plasticity	M	F		0.5
				1					1
				1.5					1.5
		MW95#2-2.0		2					2
				2.5				No well installed due to refusal with no water strike	2.5
				3	EOH @ 3.0 mbgl - Refusal				3
				3.5					3.5
				4					4
				4.5					4.5
				5					5
				5.5					5.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG MW96

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 3.0 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259321.35
NORTHING: 7307020.26
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		MW96-0.2		0	SANDY CLAY - Red and brown, medium grained sand	D	St	Rootlets to 0.3 mbgl	0
				0.5					0.5
					SANDY CLAY - Brown, medium grained sand		Fb		
		MW96-1.0		1					1
				1.5					1.5
SFA		MW96-2.0		2	WEATHERED ROCK - Brown, very hard		H		2
				2.5					2.5
				3				Well not installed due to refusal and no water strike	3
					EOH @ 3.0 mbgl - Refusal				
				3.5					3.5
				4					4
				4.5					4.5
				5					5
				5.5					5.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG MW96#2

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 4.2 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259386.72
NORTHING: 7307009.19
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
PT		MW96#2-0.2		0.5	FILL - Sandy clay, brown, with fine to medium gravels	D	St		0.5
		MW96#2-0.8			ASH - Grey, fine		VL		
				1	SANDY CLAY - Brown, fine to medium grained, trace rootlets		St		1
		MW96#2-2.0		1.5					1.5
				2	GRAVELLY SANDY CLAY - Brown, fine to medium gravels, fine to medium grained, trace rootlets				2
		MW96#2-3.0		2.5					2.5
				3	Same as above, but light brown				3
SFA		MW96#2-4.0		3.5					3.5
				4					4
				4.5	EOH @ 4.2 mbgl - Refusal				4.5
				5					5
				5.5					5.5

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

GROUNDWATER WELL LOG MW96#3

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 6.0 mbgl
DIAMETER: 150 mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259425.37
NORTHING: 7306981.48
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Well Installation Details	Depth (m)
SFA				0	FILL - Sandy clay, brown, with fine to medium gravels	D	St		Grout	
				0.5	ASH - Grey, fine		VL			
				1	SANDY CLAY - Brown, fine to medium grained, trace rootlets		St		Bentonite	
				1.5						
				2	GRAVELLY SANDY CLAY - Brown, fine to medium gravels, fine to medium grained, trace rootlets					
				2.5						
				3	Same as above, but light brown					
				3.5						
				4					Gravel	
				4.5						
				5						
				5.5				Reached target depth without water strike, a dry well was installed		
		MW96#3-6.0		6						
					EOH @ 6.0 mbgl - Target depth					

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

GROUNDWATER WELL LOG MW97

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 3.3 mbgl
DIAMETER: 150mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259480.65
NORTHING: 7306996.94
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Well Installation Details	Depth (m)
PT		MW97-0.2		0.5	SANDY CLAY - Brown, fine to medium grained sand, non plastic	D	St	BD04_0106/SD04_0106 taken at 0.2 mbgl	Grout, Bentonite	
		MW97-1.0		1	SANDY CLAY - Brown with orange/grey mottle, fine grained, low plasticity	M	F			
				1.5	SANDY GRAVELLY CLAY - Brown and grey, with medium to coarse gravel, medium plasticity					
		MW97-2.0		2	GRAVELLY CLAY - Red and white, with coarse gravels		S		Gravel	
					White rock		H			
SFA				2.5	CLAY - Grey, with basalt fragments/gravels		S			
	▽					W		Water strike at 2.8 mbgl		
		MW97-3.3		3						
				3.5	EOH @ 3.3 mbgl - Refusal					
				4						
				4.5						
				5						
				5.5						
				6						

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

▽ Encountered Groundwater
▼ Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG MW97#2

PROJECT NUMBER: BC200153.03
PROJECT NAME: CS Energy Drilling June 2023
CLIENT: CS Energy
ADDRESS:
DRILLED BY: SoilTech

DRILLING DATE: 1 June 2023
TOTAL DEPTH: 1.8 mbgl
DIAMETER: 150mm
LOGGED BY: DP
CHECKED BY: MCK

EASTING: 259491.69
NORTHING: 7306986.71
COORDINATE SYSTEM: WGS84

Drilling Method	Water Strike	Sample	Graphic Log	Depth (m)	Material Description	Moisture	Consistency Density	Additional Observations	Depth (m)
SFA				0.5	SANDY CLAY - Brown, fine to medium grained sand, non plastic	D	St	Refusal on rock before water strike, well not installed in this bore	0.5
				1	SANDY CLAY - Brown with orange/grey mottle, fine grained, low plasticity	M	F		1
				1.5					1.5
				2	EOH @ 1.8 mbgl - Refusal				2
				2.5					2.5
				3					3
				3.5					3.5
				4					4
				4.5					4.5
				5					5
				5.5					5.5
				6					6

Drilling Method
HA - Hand Auger
SFA - Solid Flight Auger
HFA - Hollow Flight Auger
PT - Pushtube
AH - Air Hammer
NDD - Non Destructive Drilling
WB Washbore

Moisture
D: Dry M: Moist W: Wet

Consistency Index
VS: Very Soft St:Stiff S:Soft VSt: Very Stiff
F: Firm H: Hard Fb: Friable

Density Index
VL: Very Loose D: Dense
L: Loose VD:Very Dense MD: Medium Dense

Descriptions based on Unified Soil Classification system.
End of Run (EOR)

Encountered Groundwater
Stabilised Groundwater

produced by ESlog.ESdat.net on 23 Jan 2024

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW81

SHEET 1 OF 3

Position : 258295.5 E 7304124.7 N MGA94 56	**Surface RL:** 209.71m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 12/7/2023	**Date Completed :** 12/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	205mm Rotary Air with Blade Bit	None	▽ Temp WL 8.57m		0.40 (209.31)		CH	FILL, Silty CLAY, red-brown, with coarse-grained road base (re-worked natural material with fill)	D	St	Samples: MW81_DC_0.0-25.0 MW81_SS_0.45-0.50		Casing stickup 0.474m
							CH	Silty CLAY, green-grey and pale yellow-brown flecks, with inclusions of weathered rock (andesite), residual soils	D	St	From 0.5 to 2.0m, weak to medium strength zones		
1													
2					2.00 (207.71)		CL	Sandy CLAY, brown, fine-grained sand, with inclusions of highly to completely weathered rock (andesite?), green and pale yellow-brown flecks, residual soils	D	St			
3					3.00 (206.71)			BRECCIA/TUFF, green-grey and pale yellow-brown flecks, highly weathered			From 3.0 to 7.8m, medium strenght bands of between 50 to 100mm thickness		Cement grout 3% bentonite
4								From 4.0 m, slightly yellow-brown and green-grey					
5													150mm diameter Class 9 PVC casing
6													
7													
8					7.80 (201.91)			BRECCIA/TUFF?, pale yellow-brown and brown, limonite inclusions			From 8.0 to 8.3m, medium strength band		
9											Temporary water level after drilling 8.57mBGL		
10					10.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW81

SHEET 2 OF 3

Position : 258295.5 E 7304124.7 N MGA94 56	**Surface RL:** 209.71m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 12/7/2023	**Date Completed :** 12/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	205mm Rotary Air with Blade Bit	None	GWE at 12m		(199.71)			BRECCIA/TUFF?, green-grey, with yellow-brown and pale yellow limonite inclusions			At 11.0m, 50mm thick medium strenght band At 12.0m, water strike At 15.0m, making water with flow of 1.4L/s. At 19.0m, flow of 1.9L/s		Cement grout 3% bentonite 150mm diameter Class 9 PVC casing Bentonite Filter pack 5 mm gravel Top of screen at 16.0m 150mm diameter stainless steel screen 1mm slot
12													
13													
14													
15													
16								At 16.0m, medium strength green-grey limonite-calcite bands					
17													
18													
19													
20					20.00			From 19.5m, grades to pale yellow-brown and green limonite bands, medium strength					

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW81

SHEET 3 OF 3

Position : 258295.5 E 7304124.7 N MGA94 56 **Surface RL:** 209.71m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 12/7/2023 **Date Completed :** 12/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	205mm Rotary Air with Blade Bit	None			(189.71)			BRECCIA/TUFF?, pale yellow-brown and green-grey					150mm diameter stainless steel screen 1mm slot
22											At 22.0m, flow of 1.9L/s		Base of screen at 22.0m
23					23.00 (186.71)			BRECCIA/TUFF?, green-grey, dark grey bands			At 23.0m, flow of 2.15L/s		Backfill with filter pack 3mm gravel
24													
25					25.00 (184.71)			End of borehole at 25.00 metres. Target Depth					
26													
27													
28													
29													
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

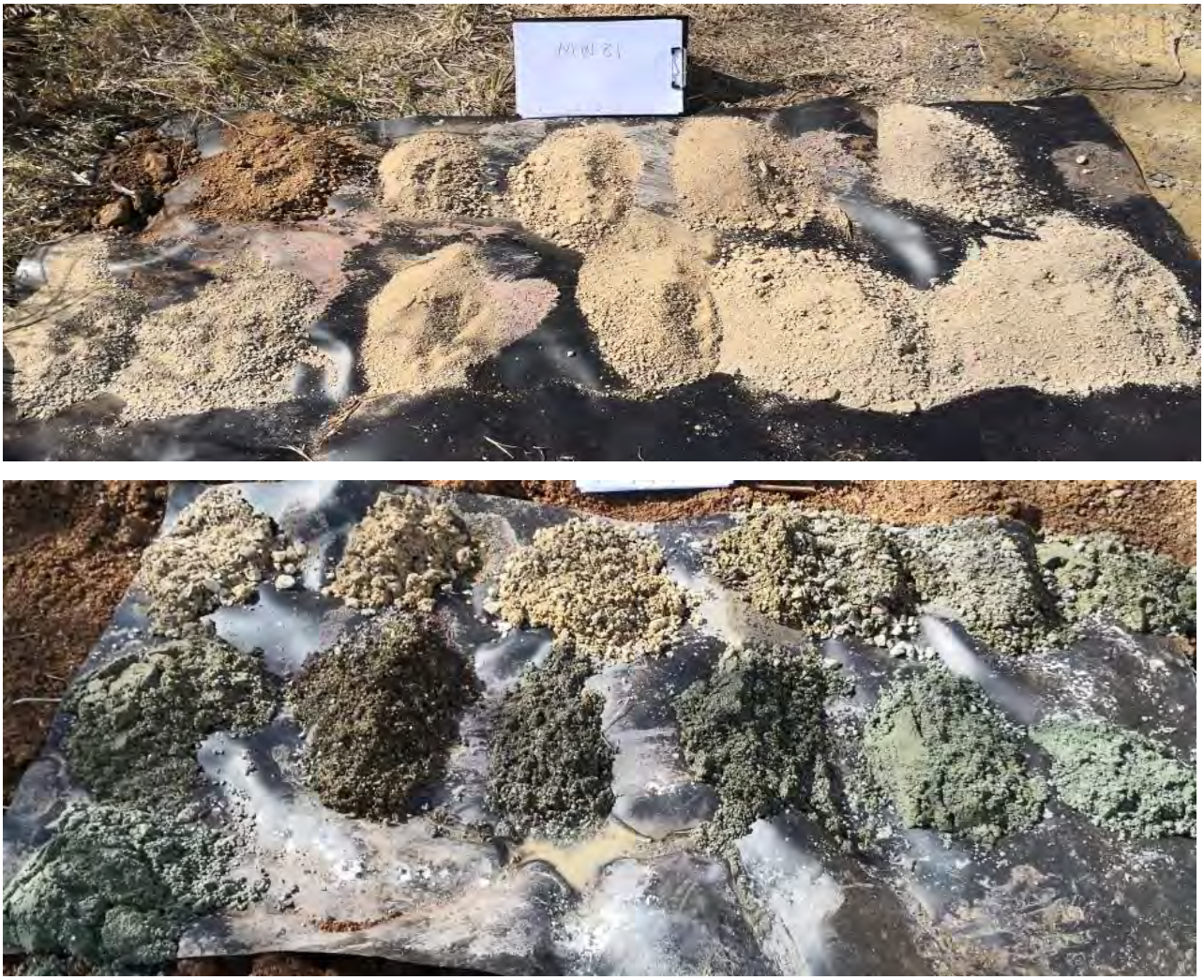


Figure D.1 Bore MW81 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW81
Easting / Northing	
Start date	12-7-23
Finish date	20-7-23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		NA
	Install casing and the ~~attached~~ tremie line		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	B.A. Llewellyn
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
TREMIE NOT REQUIRED
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW82

SHEET 1 OF 3

Position : 258241.4 E 7304075.3 N MGA94 56 **Surface RL:** 208.50m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 13/7/2023 **Date Completed :** 13/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	205mm Rotary Air with Blade Bit	None			0.20 (208.30)		CH	FILL, Silty CLAY, red-brown, with coarse-grained roadbase gravel and natural reworked residual soils	D	St	Samples: MW82_DC_0.0-25.0 (FD06_DC & FS06_DC) MW82_SS_0.35-0.45 (FD01_SS & FS01_SS)		Casing stickup 0.519m
									D	St			
								Silty CLAY, red-brown, residual soils From 0.5m, highly weathered green-grey rock inclusions (5-25mm)	D				
1													
2								From 2.0m, brown, trace labile fine-grained sand	D				
					2.50 (206.00)		ML	Sandy SILT, yellow-brown, fine-grained labile sand, residual soils, with completely to highly weathered rock fragments	D	St			Cement grout 3% bentonite
3					3.60 (204.90)			BRECCIA, yellow-brown, green-grey, white flecks, low strength, highly weathered	D				
4													
5													150mm diameter Class 9 PCV casing
6	205mm Air Hammer	None											
7													
8			GWE at 8.5m Temp WL 8.6m						W		Water stike at 8.5m Temporary borehole water level after drilling 8.6mBGL		
9					9.00 (199.50)			BRECCIA, green-grey, brown and white flecks, low to medium strength, distinctly weathered	W				
10					10.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW82

SHEET 2 OF 3

Position : 258241.4 E 7304075.3 N MGA94 56	**Surface RL:** 208.50m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 13/7/2023	**Date Completed :** 13/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	205mm Air Hammer	None			(198.50)			BRECCIA, green-grey, brown and white flecks, medium- to coarse-grained, distinctly weathered	W				Cement grout 3% bentonite
12											At 12.5m, flow of 3.6L/s		150mm diameter Class 9 PCV casing
13								After 13.0m, green-grey, white and pink flecks, with iron staining					
14													Bentinite seal
15													
16								After 15.6m, increased iron staining, minor quartz inclusions					Filter pack 5mm gravel
17													
18					18.40						At 18.0m, water flow of 7.9L/s		Top of screen at 18.0m
19					(190.10)			ANDESITE, dark grey and green-grey, fine grained, medium strength, slightly weathered	W				150mm diameter stainless steel screen 1mm slot
20													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW82

SHEET 3 OF 3

Position : 258241.4 E 7304075.3 N MGA94 56 **Surface RL:** 208.50m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 13/7/2023 **Date Completed :** 13/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	205mm Air Hammer	None						Continued. ANDESITE, dark grey and green-grey, fine grained, medium strength, slightly weathered	W W		At 21.0m, flow of 10L/s		
22													150mm diameter stainless steel screen 1mm slot
23													
24					23.80 (184.70)			SHALE, dark green-grey, low strength, moderately weathered	W		At 24.0m, flow of approx. 15L/s		Base of screen at 24.0m Backfill with filter pack 5mm gravel
25					25.00 (183.50)			End of borehole at 25.00 metres. Target Depth					
26													
27													
28													
29													
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270



Figure D.2 Bore MW82 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW82
Easting / Northing	
Start date	13.7.23
Finish date	20.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		NA
	Install casing and the attached ~~tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		
	Install head works		
	Head works observed to be installed		
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		
Completion	Bore successfully completed. Suitable for intended purpose		

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	B.d.Llewellyn
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
NO TREMIE REQUIRED
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW83

SHEET 1 OF 4

Position : 257998.1 E 7303887.7 N MGA94 56 | **Surface RL:** 197.70m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 14/7/2023 | **Date Completed :** 14/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL								WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	205mm Rotary Air with Blade Bit	None	GWE at 9.0m		0.40 (197.30)		CH	FILL, Silty CLAY, red-brown, reworked natural residual soils	D	St	Samples: MW83_SS_0.20-0.25 MW83_SS_0.50-0.55 MW83_WB_14.0-19.0 MW83_DC_0.0-37.0		Casing stickup 0.499m
							CH	FILL, Silty CLAY, red-brown, reworked natural residual soils, with COBBLES, green-grey	D	St			
1					1.00 (196.70)		CH	Silty CLAY, dark red-brown, residual soils	D	St			
2								From 2.4m, higly weathered rock inclusions, yellow-brown					
3													Cement grout 3% bentonite
4					4.20 (193.50)			Silty SAND, yellow-brown, fine-grained sub-labile sand, with fine to coarse-sized gravel, grey breccia, completely weathered residual soils	D				
5													150mm diameter Class 9 PVC casing
6					5.40 (192.30)			BRECCIA, dark grey, with green-grey and pale yellow-brown flecks, coarse-grained, highly weathered	D				
7													
8					8.40 (189.30)			ANDESITE, green-grey, with dark grey and pale yellow-brown flecks, medium strength	D				
9									W		Groundwater strike at 9.0m		
10													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW83

SHEET 2 OF 4

Position : 257998.1 E 7303887.7 N MGA94 56 | **Surface RL:** 197.70m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 14/7/2023 | **Date Completed :** 14/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	205mm Air Hammer	None						Continued. ANDESITE, green-grey, with dark grey and pale yellow-brown flecks, medium strength	D W				Cement grout 3% bentonite
12													150mm diameter Class 9 PVC casing
13								From 13.0m, dark green-grey with yellow-brown and pale yellow-brown flecks			At 13.0m, flow of 0.65L/s		
14					14.00 (183.70)			ANDESITE, dark green-grey, high strength, slightly weathered	W		At 14.0m, hard drilling, slight flow increase		Bentonite seal
15													
16													Filter pack 5mm gravel
17													Top of screen at 17.0m
18													150mm diameter stainless steel casing 1mm slots
19					19.20 (178.50)			ANDESITE, dark green-grey, with red-brown and yellow-brown inclusions, minor quartz, very high strength, slightly weathered	W		At 19.0m, flow of 0.7 L/s		
20													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW83

SHEET 3 OF 4

Position : 257998.1 E 7303887.7 N MGA94 56 | **Surface RL:** 197.70m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 14/7/2023 | **Date Completed :** 14/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	205mm Air Hammer	None						Continued. ANDESITE, dark green-grey, with red-brown and yellow-brown inclusions, minor quartz, very high strength, slightly weathered	W W				
					21.60 (176.10)			ANDESITE, dark grey, minor brown inclusions, trace quartz inclusions, very high strength	W				
22													150mm diameter stainless steel casing 1mm slots
23													Base of screen at 23.0m
24													
25											At 25.0m, flow of 0.7 L/s		Backfill with filter pack 5mm gravel
26													
27													
28													
29													
30					30.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW83

SHEET 4 OF 4

Position : 257998.1 E 7303887.7 N MGA94 56 | **Surface RL:** 197.70m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 14/7/2023 | **Date Completed :** 14/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31	205mm Air Hammer	None			(167.70)			ANDESITE, dark green-grey, minor red-brown inclusions, trace quartz inclusions, slightly weathered to fresh, very high strength	W		At 31.0m, flow of 0.7 L/s		
32													
33													Backfill with filter pack 5mm gravel
34													
35													
36													
37					37.00 (160.70)			End of borehole at 37.00 metres. Target Depth					
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270



Figure D.3 Bore MW83 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW83
Easting / Northing	
Start date	14.7.23
Finish date	20.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		
	Install casing and the ~~attached tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	B. A Llewellyn
Drilling Subcontractor	TRD	Driller	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED AS ASKED NOT AS WANTED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW84

SHEET 1 OF 5

Position : 258370.4 E 7304141.7 N MGA94 56	**Surface RL:** 212.60m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 11/7/2023	**Date Completed :** 11/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0							CH	Silty CLAY, red-brown, minor fine-grained sub-labile sand, residual soils	M	St	Samples: MW84_SS_0.10-0.20 MW84_DC_0.0-39.0		Casing stickup 0.67m
1					1.80 (210.80)		CL	Sandy CLAY, brown-red, fine-grained labile sand, residual soils	D	VSt			
2													
3													Cement grout 3% bentonite
4	100mm Rotary Air with Blade Bit				4.00 (208.60)			SILTSTONE, grey-geen, medium strength, moderately-highly weathered	D		Possibly Tertiary siltstone-shale		
5		None						From 5.0m, pale yellow-brown calcareous inclusions					50mm diameter Class 18 PVC casing
6			▽ Temp WL 5.6m					After 6.0m, grades to low-medium strength			Temporary borehole water level after drilling 5.6mBGL		
7													
8					8.00 (204.60)			ANDESITE, purple, with green-grey, low strength, highly weathered	W				
9													Bentonite seal
10													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW84

SHEET 2 OF 5

Position : 258370.4 E 7304141.7 N MGA94 56	**Surface RL:** 212.60m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 11/7/2023	**Date Completed :** 11/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Rotary Air with Blade Bit	None	GWE at 11.0m					Continued. ANDESITE, purple, with green-grey, low strength, highly weathered	W D		At 11.0m, flow of 1.0L/s Water strike at 11.0mBGL		Filter pack 3mm gravel
12													Top of screen at 12.0m
13													
14													
15											At 15.0m, flow of 1.25L/s		50mm diameter Class 18 machine slotted screen 0.5mm slots
					15.40 (197.20)			ANDESITE, dark grey, with quartz, high-very high strength, moderately weathered					
16													
17													
18					18.00 (194.60)			SHALE, green-grey, with brown, low strength, highly weathered					End Cap Base of screen at 18.0m
													Backfill with filter pack 3mm gravel
19													Bentonite seal
20													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW84

SHEET 3 OF 5

Position : 258370.4 E 7304141.7 N MGA94 56 **Surface RL:** 212.60m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 11/7/2023 **Date Completed :** 11/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	100mm Rotary Air with Blade Bit	None						Continued. SHALE, green-grey, with brown, low strength, highly weathered	W				
22													
23					23.00 (189.60)			SHALE, green-grey, low strength, moderately weathered					
24													
25					25.00 (187.60)			ANDESITE, purple, low strength, highly weathered					← Backfill with filter pack 3mm gravel
26													
27													
28					27.80 (184.80)			SHALE, green-grey, low stength, moderately-slightly weathered					
29													
30					30.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW84

SHEET 4 OF 5

Position : 258370.4 E 7304141.7 N MGA94 56 **Surface RL:** 212.60m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 11/7/2023 **Date Completed :** 11/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31					(182.60)			SHALE, slightly weathered, green-grey and brown					
32													
33													
34	100mm Rotary Air with Blade Bit	None											
35													← Backfill with filter pack 3mm gravel
36													
37													
38													
39													
40					40.00			End of borehole at 40.00 metres. Target Depth					

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy

Project : Callide Groundwater Bore Drilling Project

Location : On site, Callide B Power Station

HOLE No. MW84

SHEET 5 OF 5

Position : 258370.4 E 7304141.7 N MGA94 56 **Surface RL:** 212.60m AHD **Angle from Horiz. :** 90° **Processed :** FM

Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP

Date Started : 11/7/2023 **Date Completed :** 11/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
					(172.60)						At 40.0m, flow of 1.25 L/s		

41 42 43 44 45 46 47 48 49 50

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270



Figure D.4 Bore MW84 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW84
Easting / Northing	
Start date	MW84 11.7.23
Finish date	20.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		BL
	Suitable for drilling and construction	MW	
Assignment of licensed water bore driller	Licensed water bore driller present on site	MW	
	Water bore licence sighted by GHD		BL Qld. Class 1
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site	MW	
	GHD completed a checklist on construction materials		BL
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		BL
	Correct casing is at the drilling location and is laid out	MW	
	GHD confirmation correct casing is on-site		BL
	Field test for hydration of bentonite pellets		BL
	Measure and record the casing lengths		BL
	Mark the casing length for the location of the tremie pipe		BL. NA
	Install casing and the attached tremie line	MW	
Installation of annulus materials	Install gravel pack and measure the installation depth	MW	
	Install the bentonite seal and measure the installation depth	MW	
	Allow the bentonite seal to hydrate	MW	

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL.
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL.
	Install head works		
	Head works observed to be installed		BL.
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL.
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL.
Completion	Bore successfully completed. Suitable for intended purpose		BL.

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED ASNZS ASNZS

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW85

SHEET 1 OF 5

Position : 258045.2 E 7303790.1 N MGA94 56 **Surface RL:** 196.26m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 19/7/2023 **Date Completed :** 19/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	205mm Rotary Air with Blade Bit	None			0.30 (195.96)		CL	Sandy CLAY, red-brown and yellow-brown, fine-grained sand, residual soils	D	St	Samples: MW85_SS_0.15-0.20 MW85_SS_0.35-0.40 MW85_WB_25.0-34.0 MW85_DC_0.0-40.0		Casing stickup 0.712mm
							CH	Silty CLAY, red-brown, residual soils	D	St			
1					1.10 (195.16)			ANDESITE, green-grey, with red-brown iron staining, medium strength, distinctly weathered	D				
2													150mm diameter Class 9 PVC casing
3													Cement grout 3% bentonite
4													Bentonite seal
5									SM				
6											Temporary borehole water level after drillling 5.8mBGL at 14:15 on 19/07/2023 Temporary borehole water level after drillling 6.1mBGL at 14:00 on 19/07/2023		
7	205mm Air Hammer	None	▽ Temp WL 7.3m										Filter pack 5mm gravel
8											Temporary borehole water level after drillling 7.3mBGL at 13:50 19/07/2023		
9			▶ GWE at 9.0m						M				
10													Top of screen at 9.5m 150mm diameter stainless steel casing 1mm slots

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW85

SHEET 2 OF 5

Position : 258045.2 E 7303790.1 N MGA94 56 | **Surface RL:** 196.26m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 19/7/2023 | **Date Completed :** 19/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	205mm Air Hammer	None						Continued. ANDESITE, green-grey, with red-brown iron staining, medium strength, distinctly weathered	D M		Inflow into borehole viewed on downhole camera at 10.0m depth after drilling completed		
12													150mm diameter stainless steel casing 1mm slots
13													
14													
15													Base of screen at 15.5m
16					16.40 (179.86)			ANDESITE, green-grey, with brown iron staining, trace quartz incusions, medium strength, moderately weathered	W				
17													
18													Backfill with filter pack 5mm
19											Samples moist. No flow at collar		
20					20.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW85

SHEET 3 OF 5

Position : 258045.2 E 7303790.1 N MGA94 56 | **Surface RL:** 196.26m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 19/7/2023 | **Date Completed :** 19/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	205mm Air Hammer	None			(176.26)			ANDESITE, green-grey, trace iron staining, trace quartz, medium strength, slightly-moderately weathered	W				
22													
23													
24											From 24.0 to 25.0m, flow at collar		
25													← Backfill with filter pack 5mm
26								From 26.2m, grades to green-grey and purple, trace of quartz, medium strength			At 26.0m, no flow at collar while driling At 26.5m, flow of 0.1L/s air only		
27													
28								From 28.0m, grades to green-grey, trace quartz, medium strength					
29													
30					30.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW85

SHEET 4 OF 5

Position : 258045.2 E 7303790.1 N MGA94 56 | **Surface RL:** 196.26m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 19/7/2023 | **Date Completed :** 19/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31	205mm Air Hammer	None			(166.26)			ANDESITE, green-grey, trace quartz, medium strength, slightly-moderately weathered	W		At 30.0m, flow of 0.2L/s air only		
32													
33													
34													
35													← Backfill with filter pack 5mm
36								From 35.8m, grades to green-grey and purple, with quartz inclusions, medium strength					
37											At 37.0m, flow of 0.2L/s		
38													
39													
40					40.00			End of borehole at 40.00 metres. Target Depth			At 40.0m, flow of 0.25L/s measured		

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy

Project : Callide Groundwater Bore Drilling Project

Location : On site, Callide B Power Station

HOLE No. MW85

SHEET 5 OF 5

Position : 258045.2 E 7303790.1 N MGA94 56	**Surface RL:** 196.26m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 19/7/2023	**Date Completed :** 19/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	**Description** [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	WELL MONITOR Log	**Components**
					(156.26)								
41													
42													
43													
44													
45													
46													
47													
48													
49													
50													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12609270



Figure D.5 Bore MW85 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW85
Easting / Northing	
Start date	19.7.23
Finish date	20.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		NA Lowered
	Install casing and the ~~attached~~ tremie line		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL.
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL.
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL.
	Install head works		
	Head works observed to be installed		BL.
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL.
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		Minimal flow Not Tested.
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B. Llewellyn		
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes Bore constructed as asked

Notes
On completion of drilling to 40m it was noticed that water was flowing into the bore. JAB (Tony) used portable bore camera to locate water entering the bore at 10m depth.
Decided to cover this depth with screen of 9.5m to 15.5m
Development problems due to air pushing the low flow back into formation with minimal to no flow at collar.
Suggest develop with small pump

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW86

SHEET 1 OF 4

Position : 257074.3 E 7303520.5 N MGA94 56 **Surface RL:** 197.51m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 18/7/2023 **Date Completed :** 18/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	100mm Rotary Air with Blade Bit	None	GNE		0.40 (197.11)		CH	Silty CLAY, red-brown, rock floaters, residual soils	D	St	No water encountered - DRY - Sampling each 6m to reduce working in dust as requested by CS energy Samples: MW86_SS_0.20-0.25 MW86_SS_0.40-0.45 MW86_WB_9.0-15.0 MW86_DC_0.0-37.0		Casing stickup 0.695m
1							CL	Silty CLAY, pale grey-brown and yellow, completely weathered rock, residual soils From 1.2m, grades to yellow-brown, completely weathered siltstone	D				
2					2.40 (195.11)			SILTSTONE, yellow-brown, low strength, highly weathered	D				Cement grout 3% bentonite
3													50mm diameter Class 18 PVC casing
4													
5													
6													Bentonite seal
7													
8					8.00 (189.51)			ANDESITE, pale green-grey, medium strength, highly weathered	D				Filter pack 3mm gravel
9													Top of screen at 9.0m
10					10.00								50mm diameter Class 18 PVC casing

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW86

SHEET 2 OF 4

Position : 257074.3 E 7303520.5 N MGA94 56 | **Surface RL:** 197.51m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 18/7/2023 | **Date Completed :** 18/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Air Hammer	None	GNE		(187.51)			ANDESITE, pale green-grey and grey-brown, medium strength, highly weathered	D				
12								From 12.0m, grades to moderately weathered, green-grey					50mm diameter Class 18 PVC casing
13													
14													
15													Base of screen at 15.0m
16													Filter pack 3mm gravel
17													Bentonite seal
18													Backfill with filter pack 3mm gravel
19													
20					20.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW86

SHEET 3 OF 4

Position : 257074.3 E 7303520.5 N MGA94 56 | **Surface RL:** 197.51m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 18/7/2023 | **Date Completed :** 18/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	100mm Air Hammer	None	GNE		(177.51)			ANDESITE, green-grey, medium strength, moderately weathered	D				
22													
23													
24													
25													← Backfill with filter pack 3mm gravel
26					26.00 (171.51)			SHALE, dark purple-brown, trace quartz, medium strength, moderately weathered	D				
27											From 27.0m, possibly iron alteration andesite?		
28													
29													
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW86

SHEET 4 OF 4

Position : 257074.3 E 7303520.5 N MGA94 56 | **Surface RL:** 197.51m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 18/7/2023 | **Date Completed :** 18/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31	100mm Air Hammer	None	GNE					Continued. SHALE, dark purple-brown, trace quartz, medium strength, moderately weathered	D W				Backfill with filter pack 3mm gravel
32													
33													
34													
35													
36													
37					37.00 (160.51)			End of borehole at 37.00 metres. Target Depth					
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270



Figure D.6 Bore MW86 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW86
Easting / Northing	
Start date	18.7.26
Finish date	20.7.26

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		—
	Install casing and the attached tremie line		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B. Llewellyn	Supervisor	B. Llewellyn
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW89

SHEET 1 OF 2

Position : 258023.9 E 7303642.9 N MGA94 56 | **Surface RL:** 191.54m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 21/7/2023 | **Date Completed :** 21/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	100mm Rotary Air with Blade Bit	None			0.20 (191.34)		CL	Sandy CLAY, brown, fine-grained sand, residual soils	D	F	Samples: MW89_SS_0.20-0.25 MW89_SS_0.50-0.55 MW89_WB_5.0-11.0 MW89_DC_0.0-12.5		Casing stickup 0.657m
							CH	Silty CLAY, dark grey-brown, residual soils	D	St			
1					1.00 (190.54)		CL	Silty CLAY, dark yellow-brown, residual soils	D	St			Cement grout 3% bentonite
2					2.00 (189.54)		CH	Silty CLAY, dark brown, quartzite inclusions, residual soils	D	VSt			50mm diameter Class 18 PVC casing
3					3.00 (188.54)		CH	Silty CLAY, dark red-brown, trace of labile fine-grained sand, residual soils	D	VSt			Bentonite seal
4					4.00 (187.54)			SHALE, purple-grey, distinctly weathered	M		From 4.2m, Tuff?, fine-grained		Filter pack 3mm gravel
5													Top of screen at 5.0m
6			Temp WL 6.28m Moist						M		Temporary water level in borehole 1 hour after drilling 6.28mBGL Moisture between 6.5 to 7.0m, water strike		
7	100mm Air Hammer	None						From 7.2m, grades to medium strength					
8													50mm diameter Class 18 PVC screen 0.5mm slots
9													
10													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW89

SHEET 2 OF 2

Position : 258023.9 E 7303642.9 N MGA94 56 **Surface RL:** 191.54m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 21/7/2023 **Date Completed :** 21/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Air Hammer	None						Continued. SHALE, purple-grey, distinctly weathered	M				50mm diameter Class 18 PVC screen 0.5mm slots End Cap Base of screen at 11.0m
12					12.50 (179.04)			End of borehole at 12.50 metres. Target Depth			Blew water from hole after 10 minutes recovery without running air		Backfill with filter pack 3mm gravel
13													
14													
15													
16													
17													
18													
19													
20													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270



Figure D.7 Bore MW89 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW89
Easting / Northing	
Start date	21.7.23
Finish date	

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	~~Complete cementing of the pre-collar casing~~		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		—
	Install casing and the ~~attached tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	BL Headlyn	Supervisor	B.L Headlyn
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW90

SHEET 1 OF 4

Position : 258012.3 E 7303617.4 N MGA94 56 | **Surface RL:** 190.48m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 27/7/2023 | **Date Completed :** 27/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0							CL	Sandy CLAY, dark grey-brown, fine-grained sand, residual soils with cobbles	D	St	Samples: MW90_SS_0.10-0.20 MW90_SS_0.40-0.50 MW90_WB_0.0-31.0 MW90_DC_0.0-31.0		Casing stickup 0.636m
1	205mm Rotary Air with Blade Bit	None			1.00 (189.48)		CL	Silty CLAY, brown, residual soils	D	St			
2					2.40 (188.08)		CH	Silty CLAY, red-brown, trace fine-grained labile sand, residual soils with highly to completely weathered rock inclusions	D	St			
3													Cement grout 3% bentonite
4													
5								From 5.0m, grades to dark yellow-brown					150mm diameter Class 9 PVC casing
6													
7									M		At 7.0m, Clay grading to moist		Bentonite seal
8	205mm Air Hammer	None	GWE 8.0m		8.00 (182.48)			ANDESITE, purple, trace quartz, medium-high strength, distinctly weathered	W		At 8.0m, water strike		
9													Filter pack 5mm gravel
10													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW90

SHEET 2 OF 4

Position : 258012.3 E 7303617.4 N MGA94 56 | **Surface RL:** 190.48m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 27/7/2023 | **Date Completed :** 27/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11								Continued. ANDESITE, purple, trace quartz, medium-high strength, distinctly weathered. After 10m, highly weathered	W		At, 10m, water mist at collar after blowing air into borehole		
12													
13								After 13.0m, grades to purple-brown and dark grey					
14													
	205mm Air Hammer	None			14.80 (175.68)			ANDESITE/SHALE bands, purple, grey and green-grey, medium strength	W				150mm diameter Class 9 PVC casing
15													
16													
17					17.00 (173.48)			SHALE, purple, dark grey and green grey, with Andesite inclusions	W		From 17.0 to 20.m, Altered Andesite?		
18													
19								After 19.0m, minor quartz inclusions					
20					20.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW90

SHEET 3 OF 4

Position : 258012.3 E 7303617.4 N MGA94 56 **Surface RL:** 190.48m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 27/7/2023 **Date Completed :** 27/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	205mm Air Hammer	None			(170.48)			SHALE, dull purple, minor quartz inclusions, low-medium strength, highly weathered	W		From 20.0 to 21.0m, increase in water flow, approx. 0.2L/s From 20.0 to 31.0m, Altered Andesite?		Filter pack 5mm gravel Top of screen at 21.0m
22													
23													
24								After 24.0m, medium strength			At 24.0m, flow approximately 0.2L/s		150mm diameter stainless steel screen 1mm slots
25													
26													
27													Base of screen at 27.0m
28													
29													Backfill with filter pack 5mm gravel
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy

Project : Callide Groundwater Bore Drilling Project

Location : Off site, Callide B Power Station

HOLE No. MW90

SHEET 4 OF 4

Position : 258012.3 E 7303617.4 N MGA94 56 **Surface RL:** 190.48m AHD **Angle from Horiz. :** 90° **Processed :** FM

Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP

Date Started : 27/7/2023 **Date Completed :** 27/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31		None						Continued. SHALE, dull purple, minor quartz inclusions, low-medium strength, highly weathered	W				Backfill with filter pack 5mm gravel
					31.00 (159.48)			End of borehole at 31.00 metres. Target Depth					
32													
33													
34													
35													
36													
37													
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12609270



Figure D.8 Bore MW90 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW90
Easting / Northing	
Start date	28.7.23
Finish date	28.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		GL.
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		GL.
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		GL.
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		GL.
	Field test for hydration of bentonite pellets		GL.
	Measure and record the casing lengths		GL.
	Mark the casing length for the location of the tremie pipe		NA
	Install casing and the ~~attached tremie~~ line		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL.
	Establish appropriate grout mix ~~and pump grout through tremie line~~	NA	
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL.
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL.
	Install head works	AM	
	Head works observed to be installed		BL.
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL.
	Pits are ready for development water	AM	
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)	AM	
	Bore observed to be developed and field testing of water quality conducted		BL.
Completion	Bore successfully completed. Suitable for intended purpose	AM	BL.

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	B. Llewellyn
Drilling Subcontractor	JAB	Tony N	Licenced Water Bore Driller	AM

Construction notes

Notes
Bore constructed as advised.

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW91

SHEET 1 OF 4

Position : 258097.3 E 7303613.7 N MGA94 56 | **Surface RL:** 193.05m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 26/7/2023 | **Date Completed :** 26/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL								WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	100mm Rotary Air with Blade Bit	None			0.00 (193.05)		CH	Silty CLAY, red-brown, residual soils	D	St	Samples: MW91_SS_0.15-0.20 MW91_SS_0.45-0.50 MW91_WB_8.0-27.0 MW91_DC_0.0-30.0		Casing stickup 0.726m
					0.60 (192.45)		CL	Sandy CLAY, mottled pale red-brown, residual soils with pale yellow-brown inclusions of completely weathered rock	D	St			
1													
2					2.20 (190.85)			SHALE, purple-brown, medium strength	D		From 2.2 to 3.8m, Altered iron Andesite?		
3													50mm diameter Class 18 PVC casing
4					4.00 (189.05)			ANDESITE, green-grey and yellow-brown, medium strength, distinctly weathered	D				
5													Cement grout 3% bentonite
6								After 6.0m, grades to green-grey and purple					
7	100mm Air Hammer	None											
8								After 8.0m, high strength					
9													
10					10.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW91

SHEET 2 OF 4

Position : 258097.3 E 7303613.7 N MGA94 56 **Surface RL:** 193.05m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 26/7/2023 **Date Completed :** 26/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Air Hammer	None	GWE at 12.0m		(183.05)			ANDESITE, green-grey and speckled pale yellow-brown, high strength, moderately-highly weathered	D				Bentonite seal
12								After 12.0m, green-grey, yellow-brown, pale yellow-brown and white speckled, quartz inclusions, distinctly weathered	W		At 12.0m, water strike, approx. flow of 0.1L/s Between 12.0 and 14.0m, flow increasing to 0.8L/s		Filter pack 3mm gravel Top of screen at 12.1m
13													
14											At 14.0m, flow not increasing, approximately 0.8L/s		
15											At 15.0m, flow measured at 0.8L/s		50mm diameter Class 18 PVC screen 0.5mm slots
16													
17													
18											At 18.0m, flow of 1.5L/s		Base of screen at 18.1m
19													Backfill with filter pack 3mm gravel
20					20.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW91

SHEET 3 OF 4

Position : 258097.3 E 7303613.7 N MGA94 56 | **Surface RL:** 193.05m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 26/7/2023 | **Date Completed :** 26/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	100mm Air Hammer	None			(173.05)			ANDESITE, dark green-grey, trace quartz, high strength, moderately-slightly weathered	W				Backfill with bentonite
22													
23													
24													
25													Backfill with filter pack 3mm gravel
26								After 26.0m, grades to pale green-grey, trace quartz, high strength					
27								After 27.2m, grades to dark green-grey, trace quartz, high strength					
28													
29											At 30.0m, flow of 2.0L/s		
30					30.00			End of borehole at 30.00 metres. Target Depth					

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy

Project : Callide Groundwater Bore Drilling Project

Location : Off site, Callide B Power Station

HOLE No. MW91

Position : 258097.3 E 7303613.7 N MGA94 56 **Surface RL:** 193.05m AHD **Angle from Horiz. :** 90° **Processed :** FM

Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP

Date Started : 26/7/2023 **Date Completed :** 26/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
					(163.05)								
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270



Figure D.9 Bore MW91 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW91
Easting / Northing	
Start date	26.7.23
Finish date	

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		NA
	Install casing ~~and the attached tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~	~~JAB~~	
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works	TW	
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water	TW	
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)	TW	
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose	TW	BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative	~~JAB~~	~~Contact~~		
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	B. a Llewellyn
Drilling Subcontractor	JAB	TONY / W	Licenced Water Bore Driller	TW

Construction notes

Notes
~~TREMIE~~ NOT REQUIRED
NO PRECOLLAR CASING REQUIRED
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW94

SHEET 1 OF 3

Position : 257792.6 E 7303623.3 N MGA94 56 | **Surface RL:** 193.81m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 15/7/2023 | **Date Completed :** 15/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0							CH	Silty CLAY, red-brown, residual soils	D	St	Samples: MW94_SS_0.30-0.35 MW94_SS_0.50-0.55 MW94_WB_19.0-25.0 MW94_DC_0.0-25.0		Casing stickup 0.519m
					0.40 (193.41)		CH	Silty CLAY, grey, completely weathered shale (residual soils)	D	St			
1					1.00 (192.81)			SHALE, grey, green-grey limonite inclusions, trace carbonaceous inclusions, low-medium strength	D				
2	100mm Rotary Air with Blade Bit	None											
3								From 2.6m, dull purple-grey, black carbonaceous inclusions, medium strength					Cement grout 3% bentonite
4													
5													50mm diameter Class 18 PVC casing
6								From 6.0m, plae green-grey, no carbonaceous inclusions, medium strength					
7	100mm Air Hammer	None						From 7.2m, dull purple-grey, low strength					
8								From 8.0m, pale green-grey					
9								From 9.4m, dull purple-grey					
10					10.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW94

SHEET 2 OF 3

Position : 257792.6 E 7303623.3 N MGA94 56	**Surface RL:** 193.81m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 15/7/2023	**Date Completed :** 15/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Air Hammer	None	GWE at 19.0m		(183.81)			SHALE, dull purple-grey, low-medium strength, distinctly weathered	D				
					11.40 (182.41)			ANDESITE, green-grey, high strength, slightly weathered	D		Fine-grained TUFF?		Cement grout 3% bentonite
12													
13													
14													
15													50mm diameter Class 18 PVC casing
16													
17													Bentonite seal
18								From 18.2m, green-grey, trace yellow-brown and pale yellow-brown limonite? inclusions					Filter pack 3mm gravel
19									W		At 19.0m, water strike, approx. flow of 0.2L/s		Top of screen at 19.0m
													50mm diameter Class 18 PVC screen 0.5mm slots
20					20.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW94

SHEET 3 OF 3

Position : 257792.6 E 7303623.3 N MGA94 56 | **Surface RL:** 193.81m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 15/7/2023 | **Date Completed :** 15/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	100mm Air Hammer	None			(173.81)			TUFF, green-grey, fine-grained, slightly weathered	W		At 20.0m, approx. flow of 0.5L/s		
					20.80 (173.01)			SHALE, dark purple-grey, low strength, distinctly weathered	W				
22													Filter pack 3mm gravel
23													50mm diameter Class 18 PVC screen 0.5mm slots
24													
25					25.00 (168.81)			End of borehole at 25.00 metres. Target Depth			At 25.0m, flow of 1.4L/s		End Cap Base of screen at 25.0m
26													
27													
28													
29													
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270



Figure D.10 Bore MW94 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW 94
Easting / Northing	
Start date	15.7.23
Finish date	20.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		NA
	Install casing and ~~the attached tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	BL
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED AS ASKED NOT AS DIRECTED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW98

SHEET 1 OF 4

Position : 256822.5 E 7303493.7 N MGA94 56	**Surface RL:** 189.42m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 18/7/2023	**Date Completed :** 18/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
1	100mm Rotary Air with Blade Bit	None	GNE				CH	Sandy CLAY, dark red-brown, residual soils with rock fragments	D	St	Samples: MW98_SS_0.25-0.30 MW98_SS_0.45-0.50 MW98_WB_6.0-12.0 MW98_DC_0.0-31.0		Casing stickup 0.579m
					1.20 (188.22)		CH	Silty CLAY, red-brown, residual soils	D	St			Cement grout 3% bentonite
2								From 2.0m, grades to brown, trace inclusions			No groundwater detected during drilling		Bentonite seal
3					3.20 (186.22)			SHALE, dark red-brown, low strength, distinctly weathered	D				
4													
5								From 4.8m, grades to red-brown and grey, low-medium strength					50mm diameter Class 18 PVC casing
6													
7													
8	100mm Air Hammer	None											Filter pack 3mm gravel
9													
10					10.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW98

SHEET 2 OF 4

Position : 256822.5 E 7303493.7 N MGA94 56 **Surface RL:** 189.42m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 18/7/2023 **Date Completed :** 18/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Air Hammer	None	GNE		(179.42)			SHALE, red-brown and grey, low-medium strength, slightly-moderately weathered	D		From 10.0m, hard drilling		Filter pack 3mm gravel
12													Top of screen at 12.0m
13													
14													
15													50mm diameter Class 18 PVC screen 0.5mm slots
16													
17													
18													End Cap Base of screen at 18.0m
													Backfill with filter pack 3mm gravel
19													
20													Backfill with bentonite

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW98

SHEET 3 OF 4

Position : 256822.5 E 7303493.7 N MGA94 56 | **Surface RL:** 189.42m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 18/7/2023 | **Date Completed :** 18/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	100mm Air Hammer	None	GNE					Continued. SHALE, red-brown and grey, low-medium strength, slightly-moderately weathered	D D				
22								From 22.0m, grades to pale grey					
23								From 23.0m, grades to red-brown and grey					
24													
25													← Backfill with filter pack 3mm gravel
26													
27													
28													
29													
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy

Project : Callide Groundwater Bore Drilling Project

Location : On site, Callide B Power Station

HOLE No. MW98

SHEET 4 OF 4

Position : 256822.5 E 7303493.7 N MGA94 56 **Surface RL:** 189.42m AHD **Angle from Horiz. :** 90° **Processed :** FM

Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP

Date Started : 18/7/2023 **Date Completed :** 18/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31		None						Continued. SHALE, red-brown and grey, low-medium strength, slightly-moderately weathered	D D				Backfill with filter pack 3mm gravel
					31.00 (158.42)			End of borehole at 31.00 metres. Target Depth					
32													
33													
34													
35													
36													
37													
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12609270



Figure D.11 Bore MW93 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW98
Easting / Northing	
Start date	18-7-23
Finish date	20-7-23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		BL.
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		BL.
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		BL.
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		BL.
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		BL.
	Field test for hydration of bentonite pellets		BL.
	Measure and record the casing lengths		BL.
	Mark the casing length for the location of the tremie pipe		NA.
	Install casing and the ~~attached tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B. Llewellyn	Supervisor	B. Llewellyn
Drilling Subcontractor	JAB	Tom/W	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

APPENDIX J GROUNDWATER BORE DEVELOPMENT SHEETS

Well Development

STANDARD GROUNDWATER SAMPLING FIELD SHEET

Job Name:		Well No:	MW97
Job No:	BC200153.03	Date:	2/6/23
Recorded By:	DP	Time:	
Weather:			

CONSTRUCTION INFORMATION

Well Type:	Monitor ☒ Extraction ☐ Other:	Well Stick Up (m): (above/below ground level)	0.68 m
Well Material:	☐ PVC ☒ SS ☐ Other:	Screen Interval – Top (m BTOC)	~~2.5~~ 2.5
Well Head Condition:		Screen Interval – Bottom (m BTOC)	~~4.0~~ ~~4.0~~ 4.0

WELL PURGING

PURGE VOLUME		PURGE METHOD	
LNAPL Level Depth (LL in m BTOC):		☐ Bailer Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other	
Water Level Depth (WL in m BTOC):	2.58	☐ Pump Type: ☐ Submersible ☐ Bladder ☐ Peristaltic ☐ Other	
DNAPL Level Depth (DL in m BTOC):		PUMP INTAKE SETTING	
Total Depth of Well (TD in m BTOC):	~~3.50~~ ~~3.75~~ 4.0	Depth (m BTOC):	
Height of Standing Water Column (TD-WL, in m):		Purged dry?	☐ No ☐ Yes, at _____ L

Minimum Purge Volume Required	Well Diameter (mm)	Well Annulus (mm)	Height Standing Water Column/ Length (m)	Multiply Length by (L/m)[1]	= Total Volume (L)	Multiply Total Volume by 3[2]
	50	100		3.5		
	50	150		6.5		

[1] Volume per 1m: casing volume + filter pack volume (effective porosity assumed at 0.3) - [πr(casing)² + 0.3 x (πr(annulus)² - πr(casing)²)
[2] At a minimum, three well volumes should be purged. If possible, up to 5 well volumes is recommended to achieve an adequate purge
Reference: Victorian EPA Groundwater Sampling Guidelines April 2000, Publication 669 - Section 4.5

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged	pH	Electrical Conductivity	ORP or RedOx	DO	DO	Turbidity	Salinity Colour	TDS	Temp.
HH:MM	L	-	µS/cm	mV	ppm	% Sat	NTU			°C
2/6/23	~~~~ ~4L	7.64	663	28.3	3.72	43.5		brown		23.3
3/6/23	~4L	7.72	642	23.6	2.33	27.0		grey-brown		22.5
1/6/23	~4L	7.71	663	15.5	3.26	37.1		grey-brown		21.6
~~3/6/23~~										
Acceptable Variation		± 0.1	± 3%	± 10 mv	± 10%	± 10%	± 10%	-	-	-
Results Acceptable? Y/N										

Note: Results are acceptable after all parameters have achieved stabilisation for three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Ground-water Sampling Procedures, April 1996 (ref. EPA/540/S-95/504)

Observations during purging (well condition, turbidity, colour, odour):

Discharge water disposal: ☐ Drums ☐ Other: Purged dry 3 times

WELL SAMPLING

SAMPLING METHOD
☐ Bailer – Type: ☐ PVC ☒ SS ☐ Teflon ☐ Other
☐ Same as purge method
☐ Pump – Type: ☐ Submersible ☐ Bladder ☐ Other

SAMPLE DISTRIBUTION:

	Primary	Duplicate	Triplicate	Rinsate	Comments
Sample ID & QC Samples					
Analysis/ Bottles					

APPENDIX K LABORATORY CERTIFICATES

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2232600-AA**	Page	: 1 of 39
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
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Project	: BC200153.03	Date Samples Received	: 03-Nov-2022 09:40
Order number	: ----	Date Analysis Commenced	: 03-Nov-2022
C-O-C number	:	Issue Date	: 23-Nov-2022 16:21
Sampler	: MICHAEL KOWALCZYK		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 47		
No. of samples analysed	: 47		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD
Timothy Creagh	2IC Organic Chemist	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EP231X-SUT PFAS: Samples 'MW43' and 'MW32' required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP231X-SUT PFAS: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly. The LOR for particular analytes have been raised further due to matrix interference.
- EP231X-SUT PFAS: The LORs of PFPeS and PFOS for sample 'BD02_2510' have been raised due to sample matrix interferences.
- EP231X-SUT PFAS: Samples 'BD02_2510', 'SW13', & 'ESC4' required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X-SUT PFAS: Sample 'MW80' required dilution due to sample matrix. LOR values have been adjusted accordingly.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	PW2	SW43	PW1	SW34	NOTCH-V1
			Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-001	EB2232600-002	EB2232600-003	EB2232600-004	EB2232600-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.18	7.29	8.17	7.02	8.03
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	10400	78	10400	494	19200
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	6970	78	6790	483	13400
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	8	31	<5	461	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	115	22	105	109	424
Total Alkalinity as CaCO3	----	1	mg/L	115	22	105	109	424
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1980	10	1900	34	2430
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2510	3	2280	51	5370
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	566	5	565	20	555
Magnesium	7439-95-4	1	mg/L	394	2	380	14	856
Sodium	7440-23-5	1	mg/L	1200	7	1160	52	2620
Potassium	7440-09-7	1	mg/L	24	3	25	5	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.058	0.035	0.110	1.01	0.147
Iron	7439-89-6	0.05	mg/L	0.09	1.54	0.11	7.48	0.07
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.5	0.2	1.3	0.3	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.04	0.02	0.07
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	PW2	SW43	PW1	SW34	NOTCH-V1
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-001	EB2232600-002	EB2232600-003	EB2232600-004	EB2232600-005
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	**0.28**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**114**	**0.73**	**106**	**4.32**	**210**
ø Total Cations	----	0.01	meq/L		**113**	**0.80**	**110**	**4.54**	**212**
ø Ionic Balance	----	0.01	%		**0.37**	**4.12**	**2.12**	**2.43**	**0.38**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0131**	**0.0030**	**0.0132**	**0.188**	**0.0121**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0048**	<0.0008	**0.0049**	**0.0260**	**0.0043**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0316**	**0.0035**	**0.0379**	**0.190**	**0.0238**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0032	<0.0008	<0.0016	<0.0113	<0.0016
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0195**	**0.0026**	**0.0182**	**0.158**	**0.0127**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0032	<0.0008	<0.0016	<0.0113	<0.0016
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.0272**	**0.0063**	**0.0348**	**0.204**	<0.0079
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0038**	**0.0012**	**0.0041**	**0.436**	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0073**	**0.0019**	**0.0076**	**0.195**	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0137**	**0.0009**	**0.0105**	**0.374**	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0032	**0.0010**	**0.0025**	**0.0633**	<0.0016
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0032	<0.0008	<0.0016	<0.0113	<0.0016
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0032	<0.0008	<0.0016	<0.0113	<0.0016
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0032	<0.0008	<0.0016	<0.0113	<0.0016
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0032	<0.0008	<0.0016	<0.0113	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0032	<0.0008	<0.0016	<0.0113	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	PW2	SW43	PW1	SW34	NOTCH-V1
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-001	EB2232600-002	EB2232600-003	EB2232600-004	EB2232600-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0080	<0.0020	<0.0040	<0.0282	<0.0040
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0032	<0.0008	<0.0016	<0.0113	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.008	<0.002	<0.004	<0.028	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.008	<0.002	<0.004	<0.028	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.008	<0.002	<0.004	<0.028	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.008	<0.002	<0.004	<0.028	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0032	<0.0008	**0.0025**	<0.0113	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0032	<0.0008	**0.0028**	<0.0113	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.003	<0.001	<0.002	<0.011	<0.002
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.003	<0.001	<0.002	**0.232**	<0.002
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.003	<0.001	<0.002	**0.068**	<0.002
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.003	<0.001	<0.002	<0.011	<0.002
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0511**	**0.0061**	**0.0561**	**0.348**	**0.0365**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.116**	**0.0204**	**0.129**	**2.11**	**0.0486**
^ Sum of PFAS	----	0.0002	µg/L		**0.121**	**0.0204**	**0.139**	**2.13**	**0.0529**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**102**	**106**	**103**	**110**	**94.0**
13C8-PFOA	----	0.0005	%		**101**	**108**	**104**	**104**	**101**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	PW2	SW43	PW1	SW34	NOTCH-V1
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	*CAS Number*	*LOR*	*Unit*		**EB2232600-001**	**EB2232600-002**	**EB2232600-003**	**EB2232600-004**	**EB2232600-005**
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	NOTCH-V2	Borrow-Pit-A	SW13	SW32	SW22
			Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-006	EB2232600-007	EB2232600-008	EB2232600-009	EB2232600-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.22	8.14	8.32	7.93	8.04
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	18400	39700	14000	224	718
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	12200	29200	8890	203	437
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	16	<5	<5	16
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	10	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	428	156	416	101	98
Total Alkalinity as CaCO3	----	1	mg/L	428	156	426	101	98
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2180	5580	1520	<1	44
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4900	12400	3930	9	150
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	462	744	308	26	34
Magnesium	7439-95-4	1	mg/L	746	1990	552	6	37
Sodium	7440-23-5	1	mg/L	2440	6400	2110	10	67
Potassium	7440-09-7	1	mg/L	2	9	2	10	1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.071	0.215	0.027	0.017	0.026
Iron	7439-89-6	0.05	mg/L	<0.05	0.36	0.09	0.21	0.07
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.3	0.1	0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.06	0.02	0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.04	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	NOTCH-V2	Borrow-Pit-A	SW13	SW32	SW22
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-006	EB2232600-007	EB2232600-008	EB2232600-009	EB2232600-010
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	**0.04**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.01**	**0.50**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**192**	**469**	**151**	**2.27**	**7.10**
ø Total Cations	----	0.01	meq/L		**191**	**480**	**153**	**2.48**	**7.68**
ø Ionic Balance	----	0.01	%		**0.40**	**1.10**	**0.53**	**----**	**3.90**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0126**	**0.0298**	**0.0220**	<0.0032	**0.0048**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0052**	**0.0091**	**0.0105**	<0.0032	**0.0008**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0406**	**0.0454**	**0.0777**	<0.0032	**0.0174**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0016	<0.0016	**0.0024**	<0.0032	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0201**	**0.0069**	**0.0376**	<0.0032	**0.0074**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0032	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0080	<0.0080	**0.0142**	<0.0159	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0029**	<0.0016	**0.0040**	<0.0032	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0025**	<0.0016	**0.0027**	<0.0032	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0029**	<0.0016	**0.0062**	<0.0032	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0016	**0.0032**	<0.0032	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0032	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0032	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0032	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0032	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0032	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	NOTCH-V2	Borrow-Pit-A	SW13	SW32	SW22
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-006	EB2232600-007	EB2232600-008	EB2232600-009	EB2232600-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0040	<0.0040	<0.0080	<0.0008
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0032	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.004	<0.008	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.008	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.004	<0.004	<0.008	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.008	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0032	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0032	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.002	<0.002	<0.002	<0.003	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.002	<0.002	<0.008	<0.003	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.002	<0.002	<0.002	<0.003	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.002	<0.002	<0.002	<0.003	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0607**	**0.0523**	**0.115**	<0.0032	**0.0248**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0816**	**0.0821**	**0.168**	<0.0032	**0.0296**
^ Sum of PFAS	----	0.0002	µg/L		**0.0868**	**0.0912**	**0.180**	<0.0032	**0.0304**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**94.4**	**99.2**	**107**	**93.8**	**104**
13C8-PFOA	----	0.0005	%		**104**	**102**	**105**	**98.6**	**106**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	NOTCH-V2	Borrow-Pit-A	SW13	SW32	SW22
			Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-006	EB2232600-007	EB2232600-008	EB2232600-009	EB2232600-010
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SW20	SW40	SW36	SW02	RN13030692
			Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-011	EB2232600-012	EB2232600-013	EB2232600-014	EB2232600-015
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.48	7.71	8.67	8.01	7.56
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	386	827	374	561	506
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	221	457	211	328	283
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	12	<5	33	<5	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	18	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	131	204	94	145	154
Total Alkalinity as CaCO3	----	1	mg/L	131	204	112	145	154
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	7	12	7	27	9
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	40	124	40	76	62
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	26	49	24	32	30
Magnesium	7439-95-4	1	mg/L	14	24	13	21	15
Sodium	7440-23-5	1	mg/L	35	77	35	55	57
Potassium	7440-09-7	1	mg/L	4	2	3	4	1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.018	0.215	0.066	0.155	0.001
Iron	7439-89-6	0.05	mg/L	0.14	0.19	0.91	0.11	<0.05
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.2	0.2	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.03	0.01	0.03	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.04	<0.01	0.03	0.09
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW20	SW40	SW36	SW02	RN13030692
				Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-011	EB2232600-012	EB2232600-013	EB2232600-014	EB2232600-015
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**0.05**	<0.01	**0.03**	**0.09**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.02**	<0.01	**0.02**	**0.01**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**3.89**	**7.82**	**3.51**	**5.60**	**5.01**
ø Total Cations	----	0.01	meq/L		**4.07**	**7.82**	**3.87**	**5.82**	**5.24**
ø Ionic Balance	----	0.01	%		**2.30**	**0.02**	**4.81**	**1.90**	**2.18**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0016	**0.0030**	**0.0295**	**0.0024**	**0.0039**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0016	**0.0320**	<0.0016	**0.0027**	**0.0060**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0016	**0.0014**	<0.0016	<0.0016	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0016	**0.0434**	<0.0016	<0.0016	**0.0111**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0080	<0.0040	<0.0080	<0.0080	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0020	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW20	SW40	SW36	SW02	RN13030692
				Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-011	EB2232600-012	EB2232600-013	EB2232600-014	EB2232600-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0020	<0.0040	<0.0040	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0008	<0.0016	<0.0016	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.002	<0.004	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.002	<0.004	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.002	<0.004	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.002	<0.004	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0008	**0.0040**	<0.0016	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0008	**0.0035**	<0.0016	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.002	<0.001	<0.002	<0.002	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.002	<0.001	<0.002	<0.002	**0.004**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.002	<0.001	<0.002	<0.002	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.002	<0.001	<0.002	<0.002	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0016	**0.0754**	<0.0016	**0.0027**	**0.0171**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0016	**0.0784**	**0.0295**	**0.0051**	**0.0250**
^ Sum of PFAS	----	0.0002	µg/L		<0.0016	**0.0798**	**0.0370**	**0.0051**	**0.0250**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**97.2**	**101**	**90.5**	**97.6**	**95.3**
13C8-PFOA	----	0.0005	%		**102**	**105**	**101**	**106**	**102**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW20	SW40	SW36	SW02	RN13030692
				Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-011	EB2232600-012	EB2232600-013	EB2232600-014	EB2232600-015
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	DRD	SW12	ESC4	MW49	MW40
			Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-016	EB2232600-017	EB2232600-018	EB2232600-019	EB2232600-020
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.25	8.20	7.67	7.53	7.68
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	9680	474	10100	18000	8320
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	7380	263	6590	13400	6130
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	45	16	12	72	50
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	110	143	235	693	637
Total Alkalinity as CaCO3	----	1	mg/L	110	143	235	693	637
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1960	14	1690	1070	660
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2240	53	2100	5730	2450
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	588	30	485	606	221
Magnesium	7439-95-4	1	mg/L	357	17	504	838	493
Sodium	7440-23-5	1	mg/L	1120	42	888	2420	995
Potassium	7440-09-7	1	mg/L	27	4	<1	4	<1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	2.02	0.906	0.574	3.08	0.537
Iron	7439-89-6	0.05	mg/L	2.23	0.29	0.46	2.30	0.18
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.3	0.2	0.7	0.4	0.6
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.09	0.02	0.11	0.06
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.01	0.02	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DRD	SW12	ESC4	MW49	MW40
				Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-016	EB2232600-017	EB2232600-018	EB2232600-019	EB2232600-020
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.01**	**0.02**	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.01**	<0.01	<0.01	**0.02**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**106**	**4.64**	**99.1**	**198**	**95.6**
ø Total Cations	----	0.01	meq/L		**108**	**4.82**	**104**	**204**	**94.9**
ø Ionic Balance	----	0.01	%		**0.90**	**1.92**	**2.55**	**1.69**	**0.36**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0157	<0.0032	**0.0281**	**0.178**	**0.0521**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0157	<0.0032	**0.0231**	**0.195**	**0.0287**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0299**	<0.0032	**0.170**	**2.24**	**0.212**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0157	<0.0032	**0.0043**	**0.0258**	**0.0098**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0189**	<0.0032	**0.0471**	**0.495**	**0.254**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0157	<0.0032	<0.0016	<0.0007	<0.0008
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0787	<0.0159	**0.0084**	**0.0785**	**0.0079**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0157	<0.0032	<0.0016	**0.0097**	**0.0017**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0157	<0.0032	<0.0016	<0.0007	**0.0013**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0157	<0.0032	<0.0016	**0.0316**	**0.0058**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0157	<0.0032	<0.0016	**0.0049**	<0.0008
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0157	<0.0032	<0.0016	<0.0007	<0.0008
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0157	<0.0032	<0.0016	<0.0007	<0.0008
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0157	<0.0032	<0.0016	<0.0007	<0.0008
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0157	<0.0032	<0.0016	<0.0007	<0.0008
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0157	<0.0032	<0.0016	<0.0007	<0.0008

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	DRD	SW12	ESC4	MW49	MW40
			Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-016	EB2232600-017	EB2232600-018	EB2232600-019	EB2232600-020
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0394	<0.0080	<0.0040	<0.0017	<0.0020
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0157	<0.0032	<0.0016	<0.0007	<0.0008
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.039	<0.008	<0.004	<0.002	<0.002
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.039	<0.008	<0.004	<0.002	<0.002
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.039	<0.008	<0.004	<0.002	<0.002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.039	<0.008	<0.004	<0.002	<0.002
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0157	<0.0032	<0.0016	<0.0007	<0.0008
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0157	<0.0032	<0.0016	<0.0007	<0.0008
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.016	<0.003	<0.002	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.016	<0.003	<0.008	**0.253**	**0.243**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.016	<0.003	<0.002	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.016	<0.003	<0.002	<0.001	<0.001
EP231P: PFAS Sums								
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	**0.0488**	<0.0032	**0.217**	**2.74**	**0.466**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L	**0.0488**	<0.0032	**0.254**	**3.29**	**0.778**
^ Sum of PFAS	----	0.0002	µg/L	**0.0488**	<0.0032	**0.281**	**3.51**	**0.816**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0005	%	**100**	**99.8**	**97.7**	**113**	**93.4**
13C8-PFOA	----	0.0005	%	**100**	**104**	**99.2**	**106**	**96.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DRD	SW12	ESC4	MW49	MW40
				Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-016	EB2232600-017	EB2232600-018	EB2232600-019	EB2232600-020
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW79	MW70	MW80	MW69	ESC3
			Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-021	EB2232600-022	EB2232600-023	EB2232600-024	EB2232600-026
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.40	7.57	11.3	7.67	7.74
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	8360	899	612	1050	8680
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	6120	574	288	674	6540
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	53	8	22	7	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	80	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	65	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	371	166	<1	184	261
Total Alkalinity as CaCO3	----	1	mg/L	371	166	145	184	261
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	177	48	6	59	1530
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2830	155	30	194	1890
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	637	63	32	74	318
Magnesium	7439-95-4	1	mg/L	556	33	<1	37	476
Sodium	7440-23-5	1	mg/L	353	72	31	93	1140
Potassium	7440-09-7	1	mg/L	3	2	52	2	1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	3.08	0.225	0.041	0.016	3.27
Iron	7439-89-6	0.05	mg/L	3.71	0.15	0.68	0.14	<0.05
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2	0.1	<0.1	0.1	1.0
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.04	<0.01	0.13	<0.01	0.06
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	0.15	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.40	<0.01	0.02	0.02	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW79	MW70	MW80	MW69	ESC3
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-021	EB2232600-022	EB2232600-023	EB2232600-024	EB2232600-026
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.55**	<0.01	**0.02**	**0.02**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	**0.01**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**90.9**	**8.69**	**3.87**	**10.4**	**90.4**
ø Total Cations	----	0.01	meq/L		**93.0**	**9.04**	**4.28**	**10.8**	**105**
ø Ionic Balance	----	0.01	%		**1.11**	**2.00**	**5.00**	**2.15**	**7.32**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0099**	**0.0016**	**0.0060**	**0.0017**	**0.0166**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0049**	**0.0007**	<0.0016	**0.0011**	**0.0115**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0301**	**0.0113**	<0.0016	**0.0136**	**0.0643**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0016	**0.0006**	<0.0016	<0.0005	<0.0016
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0029**	**0.0403**	**0.0052**	**0.0335**	**0.0315**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0016	<0.0005	<0.0016	<0.0005	<0.0016
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0080	<0.0080	**0.0480**	<0.0080	<0.0080
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0016	**0.0040**	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0005	<0.0016	<0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0005	<0.0016	<0.0005	<0.0016
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0005	<0.0016	<0.0005	<0.0016
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0016	<0.0005	<0.0016	<0.0005	<0.0016
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0016
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW79	MW70	MW80	MW69	ESC3
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-021	EB2232600-022	EB2232600-023	EB2232600-024	EB2232600-026
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0040	<0.0400	<0.0040	<0.0040
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.040	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.040	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.004	<0.040	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.040	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.002	<0.001	<0.016	<0.001	<0.002
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.002**	<0.002	<0.016	**0.004**	<0.002
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.002	<0.001	<0.016	<0.001	<0.002
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.002	<0.001	<0.016	<0.001	<0.002
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0330**	**0.0516**	**0.0052**	**0.0471**	**0.0958**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0449**	**0.0532**	**0.0632**	**0.0528**	**0.112**
^ Sum of PFAS	----	0.0002	µg/L		**0.0498**	**0.0545**	**0.0632**	**0.0539**	**0.124**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**91.0**	**100**	**93.6**	**89.3**	**105**
13C8-PFOA	----	0.0005	%		**94.7**	**97.5**	**96.4**	**98.4**	**102**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	MW79	MW70	MW80	MW69	ESC3
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	28-Oct-2022 00:00
Compound	*CAS Number*	*LOR*	*Unit*		**EB2232600-021**	**EB2232600-022**	**EB2232600-023**	**EB2232600-024**	**EB2232600-026**
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW31	MW11	MW30	MW73	RN13030698
			Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-027	EB2232600-028	EB2232600-029	EB2232600-030	EB2232600-031
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.95	7.74	7.60	7.56	8.00
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	3890	9160	2820	1640	2050
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	2400	7330	2280	1170	1320
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	6	10	8	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	495	224	346	147	318
Total Alkalinity as CaCO3	----	1	mg/L	495	224	346	147	318
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	16	1840	421	62	43
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1000	2400	572	413	470
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	85	509	347	130	143
Magnesium	7439-95-4	1	mg/L	210	515	111	70	75
Sodium	7440-23-5	1	mg/L	487	1060	142	98	189
Potassium	7440-09-7	1	mg/L	<1	<1	<1	3	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.190	1.87	0.266	0.062	0.002
Iron	7439-89-6	0.05	mg/L	<0.05	0.10	0.43	0.11	<0.05
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.8	0.5	0.1	<0.1	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.03	0.07	<0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.21	<0.01	0.02	<0.01	8.52
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW31	MW11	MW30	MW73	RN13030698
				Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-027	EB2232600-028	EB2232600-029	EB2232600-030	EB2232600-031
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.21**	<0.01	**0.02**	<0.01	**8.52**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.03**	<0.01	<0.01	<0.01	**0.02**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**38.4**	**110**	**31.8**	**15.9**	**20.5**
ø Total Cations	----	0.01	meq/L		**42.7**	**114**	**32.6**	**16.6**	**21.6**
ø Ionic Balance	----	0.01	%		**5.27**	**1.52**	**1.26**	**2.18**	**2.55**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0016	**0.0147**	**0.0403**	**0.0014**	**0.0033**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	**0.0067**	**0.0368**	**0.0011**	**0.0037**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	**0.0342**	**0.236**	**0.0150**	**0.0436**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	**0.0009**	**0.0090**	**0.0014**	**0.0006**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0003**	**0.0174**	**0.0540**	**0.0710**	**0.0053**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0080	<0.0080	**0.0108**	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0016	**0.0012**	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0016	**0.0016**	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0016	**0.0041**	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0016	**0.0035**	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW31	MW11	MW30	MW73	RN13030698
				Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-027	EB2232600-028	EB2232600-029	EB2232600-030	EB2232600-031
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0245	<0.0005	<0.0040	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0016	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.001	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.001	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.004	<0.001	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.001	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.010**	**0.003**	**0.016**	**0.002**	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0003**	**0.0516**	**0.290**	**0.0860**	**0.0489**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0103**	**0.0693**	**0.368**	**0.0894**	**0.0522**
^ Sum of PFAS	----	0.0002	µg/L		**0.0103**	**0.0769**	**0.413**	**0.0919**	**0.0565**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**95.5**	**99.7**	**106**	**92.7**	**98.3**
13C8-PFOA	----	0.0005	%		**97.8**	**94.7**	**95.3**	**94.8**	**94.1**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW31	MW11	MW30	MW73	RN13030698
				Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-027	EB2232600-028	EB2232600-029	EB2232600-030	EB2232600-031
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW43	MW72	RN13030126	MW32	MW75
			Sampling date / time	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	31-Oct-2022 00:00	01-Nov-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-032	EB2232600-033	EB2232600-034	EB2232600-035	EB2232600-037
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.98	7.99	7.37	7.14	7.26
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	6800	846	531	7110	18700
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	4890	524	318	4780	11500
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	20	7	<5	26	30
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	526	178	157	512	1180
Total Alkalinity as CaCO3	----	1	mg/L	526	178	157	512	1180
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	964	49	11	970	330
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1370	130	77	1690	5820
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	298	56	36	505	186
Magnesium	7439-95-4	1	mg/L	533	31	18	555	501
Sodium	7440-23-5	1	mg/L	408	72	55	319	3320
Potassium	7440-09-7	1	mg/L	1	4	1	<1	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.157	0.245	0.002	0.824	0.572
Iron	7439-89-6	0.05	mg/L	0.60	0.08	<0.05	2.72	0.44
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.5	0.1	0.1	0.6	0.7
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.02	<0.01	0.02	0.03
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.22	0.06	<0.01	0.05
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW43	MW72	RN13030126	MW32	MW75
				Sampling date / time	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	31-Oct-2022 00:00	01-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-032	EB2232600-033	EB2232600-034	EB2232600-035	EB2232600-037
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.22**	**0.06**	<0.01	**0.05**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.02**	<0.01	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**69.2**	**8.24**	**5.54**	**78.1**	**195**
ø Total Cations	----	0.01	meq/L		**76.5**	**8.58**	**5.70**	**84.8**	**195**
ø Ionic Balance	----	0.01	%		**5.00**	**2.00**	**1.40**	**4.09**	**0.09**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.199**	**0.0011**	<0.0005	**0.484**	**0.0154**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.217**	<0.0005	<0.0005	**0.642**	<0.0016
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**1.45**	**0.0040**	**0.0028**	**4.04**	**0.0066**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0391**	<0.0005	<0.0005	**0.131**	<0.0016
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.154**	**0.0035**	**0.0025**	**0.988**	<0.0016
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0079	<0.0016
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.107**	<0.0080	<0.0020	**0.194**	<0.0080
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0654**	<0.0016	<0.0005	**0.198**	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0391**	<0.0016	<0.0005	**0.132**	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.300**	<0.0016	<0.0005	**1.13**	**0.0046**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0551**	<0.0005	<0.0005	**0.183**	<0.0016
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0079	<0.0016
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0079	<0.0016
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0079	<0.0016
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0079	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0079	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW43	MW72	RN13030126	MW32	MW75
				Sampling date / time	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	31-Oct-2022 00:00	01-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-032	EB2232600-033	EB2232600-034	EB2232600-035	EB2232600-037
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0040	<0.0005	<0.0198	<0.0040
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0079	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.001	<0.020	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.001	<0.020	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.004	<0.001	<0.020	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.001	<0.020	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0079	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0079	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.002	<0.002	<0.001	<0.008	<0.002
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.013**	**0.001**	<0.001	<0.008	**0.028**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.002	<0.001	<0.001	<0.008	<0.002
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.002	<0.001	<0.001	<0.008	<0.002
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**1.60**	**0.0075**	**0.0053**	**5.03**	**0.0066**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**2.38**	**0.0096**	**0.0053**	**7.35**	**0.0546**
^ Sum of PFAS	----	0.0002	µg/L		**2.64**	**0.0096**	**0.0053**	**8.12**	**0.0546**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**95.7**	**106**	**90.8**	**95.2**	**96.9**
13C8-PFOA	----	0.0005	%		**88.5**	**96.2**	**91.2**	**94.5**	**102**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	MW43	MW72	RN13030126	MW32	MW75
			Sampling date / time	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	31-Oct-2022 00:00	01-Nov-2022 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**EB2232600-032**	**EB2232600-033**	**EB2232600-034**	**EB2232600-035**	**EB2232600-037**
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BD01_2510	BD02_2510	BD03_2710	BD04_2910	RB_2710
			Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	27-Oct-2022 00:00	29-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-038	EB2232600-039	EB2232600-040	EB2232600-041	EB2232600-042
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.24	7.95	8.12	7.25	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	17000	18800	1760	2050	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	12500	13800	996	1400	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	<5	<5	<5	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	429	423	316	314	----
Total Alkalinity as CaCO3	----	1	mg/L	429	423	316	314	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2210	2460	60	43	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4760	5440	352	468	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	465	566	95	146	----
Magnesium	7439-95-4	1	mg/L	738	864	47	70	----
Sodium	7440-23-5	1	mg/L	2450	2620	220	178	----
Potassium	7440-09-7	1	mg/L	2	2	2	2	----
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.076	0.149	<0.001	0.001	----
Iron	7439-89-6	0.05	mg/L	0.06	0.08	<0.05	<0.05	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.2	0.2	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.08	0.02	0.03	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	0.72	8.59	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD01_2510	BD02_2510	BD03_2710	BD04_2910	RB_2710
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	27-Oct-2022 00:00	29-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-038	EB2232600-039	EB2232600-040	EB2232600-041	EB2232600-042
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	**0.72**	**8.59**	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.01**	**0.02**	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**189**	**213**	**17.5**	**20.4**	----
ø Total Cations	----	0.01	meq/L		**190**	**213**	**18.2**	**20.8**	----
ø Ionic Balance	----	0.01	%		**0.45**	**0.06**	**2.06**	**1.14**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0120**	**0.0107**	**0.0022**	**0.0032**	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0064**	<0.0035	**0.0029**	**0.0041**	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0356**	**0.0209**	**0.0270**	**0.0409**	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0016	<0.0016	**0.0011**	**0.0009**	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0264**	<0.0148	**0.0810**	**0.0057**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0080	<0.0080	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0026**	<0.0016	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0026**	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0016	**0.0008**	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD01_2510	BD02_2510	BD03_2710	BD04_2910	RB_2710
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	27-Oct-2022 00:00	29-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-038	EB2232600-039	EB2232600-040	EB2232600-041	EB2232600-042
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0040	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.004	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.002	<0.002	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.002	<0.002	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.002	<0.002	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.002	<0.002	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0620**	**0.0209**	**0.108**	**0.0466**	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0792**	**0.0316**	**0.111**	**0.0498**	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		**0.0856**	**0.0316**	**0.115**	**0.0548**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**108**	**103**	**95.9**	**104**	**98.6**
13C8-PFOA	----	0.0005	%		**98.8**	**97.7**	**99.3**	**103**	**102**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BD01_2510	BD02_2510	BD03_2710	BD04_2910	RB_2710
			Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	27-Oct-2022 00:00	29-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232600-038	EB2232600-039	EB2232600-040	EB2232600-041	EB2232600-042
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB_2810	RB_2910	FB_2510	FB_2710	FB_2810
				Sampling date / time	28-Oct-2022 00:00	29-Oct-2022 00:00	25-Oct-2022 00:00	27-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-043	EB2232600-044	EB2232600-045	EB2232600-046	EB2232600-047
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB_2810	RB_2910	FB_2510	FB_2710	FB_2810
				Sampling date / time	28-Oct-2022 00:00	29-Oct-2022 00:00	25-Oct-2022 00:00	27-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232600-043	EB2232600-044	EB2232600-045	EB2232600-046	EB2232600-047
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**109**	**117**	**131**	**115**	**93.7**
13C8-PFOA	----	0.0005	%		**96.7**	**101**	**108**	**110**	**104**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB_2910	FB_3110	----	----	----
				Sampling date / time	29-Oct-2022 00:00	31-Oct-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2232600-048	EB2232600-049	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB_2910	FB_3110	----	----	----
				Sampling date / time	29-Oct-2022 00:00	31-Oct-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2232600-048	EB2232600-049	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0002	<0.0002	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**93.8**	**99.8**	----	----	----
13C8-PFOA	----	0.0005	%		**105**	**106**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2232600-AC**	Page	: 1 of 7
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 03-Nov-2022 09:40
Order number	: ----	Date Analysis Commenced	: 03-Nov-2022
C-O-C number	:	Issue Date	: 23-Nov-2022 16:22
Sampler	: MICHAEL KOWALCZYK		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	2IC Organic Chemist	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EP231X-SUT PFAS: Samples 'MW43' and 'MW32' required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP231X-SUT PFAS: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly. The LOR for particular analytes have been raised further due to matrix interference.
- EP231X-SUT PFAS: The LORs of PFPeS and PFOS for sample 'BD02_2510' have been raised due to sample matrix interferences.
- EP231X-SUT PFAS: Samples 'BD02_2510', 'SW13', & 'ESC4' required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X-SUT PFAS: Sample 'MW80' required dilution due to sample matrix. LOR values have been adjusted accordingly.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L006-B05	----	----	----	----
				Sampling date / time	01-Nov-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2232600-036	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.35**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**1650**	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**1180**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**6**	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**155**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**155**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**57**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**426**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**119**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**64**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**121**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**1**	----	----	----	----
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		**0.009**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**0.42**	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.1**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.01**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.76**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L006-B05	----	----	----	----
				Sampling date / time	01-Nov-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2232600-036	--------	--------	--------	--------
					Result	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.76**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**16.3**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**16.5**	----	----	----	----
ø Ionic Balance	----	0.01	%		**0.59**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0029**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0026**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0215**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0010**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0477**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.0023**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L006-B05	----	----	----	----
				Sampling date / time	01-Nov-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2232600-036	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.0692**	----	----	----	----
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.0744**	----	----	----	----
^ **Sum of PFAS**	----	0.0002	µg/L		**0.0780**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**91.9**	----	----	----	----
13C8-PFOA	----	0.0005	%		**93.5**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	**L006-B05**	**----**	**----**	**----**	**----**
				Sampling date / time	01-Nov-2022 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EB2232600-036**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
EP231S: PFAS Surrogate - Continued									

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2232600-AA**	Page	: 1 of 22
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 03-Nov-2022
Order number	: ----	Date Analysis Commenced	: 03-Nov-2022
C-O-C number	:	Issue Date	: 23-Nov-2022
Sampler	: MICHAEL KOWALCZYK		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 47		
No. of samples analysed	: 47		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD
Timothy Creagh	2IC Organic Chemist	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4680202)									
EB2232600-014	SW02	EA005-P: pH Value	----	0.01	pH Unit	8.01	8.04	0.4	0% - 20%
EB2232380-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.00	8.00	0.0	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 4680208)									
EB2232616-007	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.08	7.00	1.1	0% - 20%
EB2232616-017	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	4.74	4.76	0.4	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 4680211)									
EB2232600-020	MW40	EA005-P: pH Value	----	0.01	pH Unit	7.68	7.65	0.4	0% - 20%
EB2232600-030	MW73	EA005-P: pH Value	----	0.01	pH Unit	7.56	7.54	0.3	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 4680215)									
EB2232600-034	RN13030126	EA005-P: pH Value	----	0.01	pH Unit	7.37	7.45	1.1	0% - 20%
EB2232600-007	Borrow-Pit-A	EA005-P: pH Value	----	0.01	pH Unit	8.14	8.11	0.4	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 4681089)									
EB2232592-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.75	6.72	0.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4680203)									
EB2232600-014	SW02	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	561	555	1.2	0% - 20%
EB2232380-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	383	379	1.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4680209)									
EB2232616-007	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	786	811	3.2	0% - 20%
EB2232616-017	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	404	406	0.5	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4680212)									
EB2232600-020	MW40	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	8320	8320	0.0	0% - 20%
EB2232600-030	MW73	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1640	1650	0.5	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA010P: Conductivity by PC Titrator (QC Lot: 4680216)									
EB2232600-034	RN13030126	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	531	545	2.5	0% - 20%
EB2232600-007	Borrow-Pit-A	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	39700	39100	1.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4681090)									
EB2232617-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	521	529	1.5	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4680745)									
EB2232468-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	2280	2260	0.9	0% - 20%
EB2232600-005	NOTCH-V1	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	13400	13400	0.1	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4680746)									
EB2232600-016	DRD	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	7380	7390	0.1	0% - 20%
EB2232600-025	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	975	994	2.0	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4680747)									
EB2232600-036	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1180	1190	1.4	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4682325)									
EB2232289-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	20	22	8.4	No Limit
EB2232600-008	SW13	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4682326)									
EB2232600-018	ESC4	EA025H: Suspended Solids (SS)	----	5	mg/L	12	10	14.0	No Limit
EB2232600-028	MW11	EA025H: Suspended Solids (SS)	----	5	mg/L	6	6	0.0	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4682327)									
EB2232600-038	BD01_2510	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EB2232603-007	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	39	35	9.5	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4680205)									
EB2232600-014	SW02	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	145	147	1.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	145	147	1.2	0% - 20%
EB2232380-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	108	107	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	108	107	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4680207)									
EB2232616-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	80	79	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	80	79	0.0	0% - 20%
EB2232616-017	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 4680207) - continued									
EB2232616-017	Anonymous	ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4680214)									
EB2232600-020	MW40	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	637	630	1.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	637	630	1.2	0% - 20%
EB2232600-030	MW73	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	147	147	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	147	147	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4680218)									
EB2232600-034	RN13030126	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	157	156	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	157	156	0.0	0% - 20%
EB2232600-007	Borrow-Pit-A	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	156	156	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	156	156	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4681084)									
EB2232592-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	6	6	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	6	6	0.0	No Limit
EB2232409-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	240	242	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	240	242	0.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4680228)									
EB2232616-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	26	0.0	0% - 20%
EB2232616-021	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	302	295	2.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4680229)									
EB2232600-041	BD04_2910	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	43	43	0.0	0% - 20%
EB2232600-009	SW32	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4680230)									
EB2232600-021	MW79	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	177	176	0.0	0% - 20%
EB2232600-040	BD03_2710	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	60	60	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4680234)									
EB2232600-017	SW12	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	14	15	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4680234) - continued									
EB2232380-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	512	516	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4680489)									
EB2232595-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	609	604	0.8	0% - 20%
EB2232538-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	201	200	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4680225)									
EB2232616-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	24	25	0.0	0% - 20%
EB2232616-021	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3120	3340	6.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4680226)									
EB2232600-041	BD04_2910	ED045G: Chloride	16887-00-6	1	mg/L	468	467	0.4	0% - 20%
EB2232600-009	SW32	ED045G: Chloride	16887-00-6	1	mg/L	9	9	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4680227)									
EB2232600-021	MW79	ED045G: Chloride	16887-00-6	1	mg/L	2830	2880	1.8	0% - 20%
EB2232600-040	BD03_2710	ED045G: Chloride	16887-00-6	1	mg/L	352	350	0.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4680233)									
EB2232600-017	SW12	ED045G: Chloride	16887-00-6	1	mg/L	53	53	0.0	0% - 20%
EB2232380-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2170	2200	1.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4680488)									
EB2232595-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	611	612	0.0	0% - 20%
EB2232538-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	166	167	0.7	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4698693)									
EB2232600-041	BD04_2910	ED093F: Calcium	7440-70-2	1	mg/L	146	147	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	70	72	1.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	178	180	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EB2230297-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	14	15	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	6	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	23	23	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	6	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4698698)									
EB2232600-001	PW2	ED093F: Calcium	7440-70-2	1	mg/L	566	570	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	394	393	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1200	1210	0.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	24	25	0.0	0% - 20%
EB2232600-010	SW22	ED093F: Calcium	7440-70-2	1	mg/L	34	31	9.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	37	34	8.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	67	62	6.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4698699)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4698699) - continued									
EB2232600-021	MW79	ED093F: Calcium	7440-70-2	1	mg/L	637	628	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	556	530	4.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	353	342	3.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EB2232600-030	MW73	ED093F: Calcium	7440-70-2	1	mg/L	130	131	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	70	70	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	98	96	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4682575)									
EB2232380-010	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.987	0.968	1.9	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	59.8	57.6	3.8	0% - 20%
EB2232643-001	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.014	0.013	0.0	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.64	0.63	2.4	0% - 50%
EG020T: Total Metals by ICP-MS (QC Lot: 4683238)									
EB2232688-003	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	1.22	1.21	0.7	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	76.7	75.6	1.4	0% - 20%
EB2232688-013	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.526	0.522	0.8	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	46.9	45.6	2.7	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 4683239)									
EB2232600-025	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4684414)									
EB2232600-041	BD04_2910	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2232600-017	SW12	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.906	0.883	2.6	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.29	0.28	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4685239)									
EB2232600-011	SW20	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.018	0.018	0.0	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.14	0.14	0.0	No Limit
EB2232729-006	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.12	0.12	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4680204)									
EB2232600-014	SW02	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
EB2232380-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4680210)									
EB2232616-007	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4680213)									
EB2232600-020	MW40	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.6	0.6	0.0	No Limit
EB2232600-030	MW73	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK040P: Fluoride by PC Titrator (QC Lot: 4680217)									
EB2232600-034	RN13030126	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EB2232600-007	Borrow-Pit-A	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4681088)									
EB2232577-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4686355)									
EB2232600-001	PW2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.02	75.0	No Limit
EB2232600-011	SW20	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4686357)									
EB2232600-021	MW79	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.0	No Limit
EB2232600-031	RN13030698	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4686359)									
EB2232600-041	BD04_2910	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.03	<0.01	91.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4680219)									
EB2232616-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232616-021	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4680220)									
EB2232600-041	BD04_2910	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232600-009	SW32	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4680221)									
EB2232600-021	MW79	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.15	0.15	0.0	0% - 50%
EB2232600-040	BD03_2710	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4680232)									
EB2232600-017	SW12	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232380-006	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4680487)									
EB2232595-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232538-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4686356)									
EB2232600-001	PW2	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232600-011	SW20	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4686358)									
EB2232600-021	MW79	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.55	0.56	0.0	0% - 20%
EB2232600-031	RN13030698	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	8.52	8.57	0.6	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4686360)									
EB2232600-041	BD04_2910	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	8.59	9.03	5.0	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4680222)									
EB2232616-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232616-021	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4680223)									
EB2232600-041	BD04_2910	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.02	0.02	0.0	No Limit
EB2232600-009	SW32	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.50	0.50	0.0	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4680224)									
EB2232600-021	MW79	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232600-040	BD03_2710	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4680231)									
EB2232600-017	SW12	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4680490)									
EB2232595-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.16	0.16	0.0	0% - 50%
EB2232538-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4685573)									
EB2232600-001	PW2	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	0.0195	0.0207	6.0	No Limit
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0131	0.0121	7.9	No Limit
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	0.0048	<0.0032	40.3	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0316	0.0325	2.7	0% - 50%
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
EB2232600-011	SW20	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4685573)									
EB2232600-001	PW2	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	0.0038	0.0054	34.2	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.0137	0.0130	5.1	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	0.0073	0.0044	48.9	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4685573) - continued									
EB2232600-001	PW2	EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0080	<0.0080	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	0.0272	0.0248	8.9	No Limit
EB2232600-011	SW20	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0040	<0.0040	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0080	<0.0080	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4685573)									
EB2232600-001	PW2	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.008	<0.008	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.008	<0.008	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.008	<0.008	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.008	<0.008	0.0	No Limit
EB2232600-011	SW20	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4685573) - continued									
EB2232600-011	SW20	EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.004	<0.004	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.004	<0.004	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.004	<0.004	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.004	<0.004	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4685573)									
EB2232600-001	PW2	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.003	<0.003	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.003	<0.003	0.0	No Limit
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.003	<0.003	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.003	<0.003	0.0	No Limit
EB2232600-011	SW20	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.002	<0.002	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4685573)									
EB2232600-001	PW2	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0511	0.0532	4.0	0% - 50%
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.116	0.113	2.9	0% - 20%
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	0.121	0.113	6.9	0% - 20%
EB2232600-011	SW20	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0016	<0.0016	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4680202)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 4680208)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 4680211)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 4680215)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 4681089)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4680203)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	98.4	90.0	106
				<1	12890 µS/cm	95.4	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 4680209)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	99.6	90.0	106
				<1	12890 µS/cm	102	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 4680212)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	102	90.0	106
				<1	24800 µS/cm	99.4	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 4680216)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	94.2	90.0	106
				<1	24800 µS/cm	97.0	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 4681090)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	99.3	90.0	106
				<1	12890 µS/cm	99.4	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4680745)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	99.1	88.0	112
				<10	2000 mg/L	95.2	80.9	118
				<10	2420 mg/L	106	81.4	119

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4680746)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	104	88.0	112
				<10	2000 mg/L	95.1	80.9	118
				<10	2420 mg/L	101	81.4	119
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4680747)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	109	88.0	112
				<10	2000 mg/L	96.5	80.9	118
				<10	2420 mg/L	104	81.4	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4682325)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	95.5	88.0	112
				<5	1000 mg/L	91.2	88.0	112
				<5	945 mg/L	108	84.8	115
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4682326)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	103	88.0	112
				<5	1000 mg/L	92.4	88.0	112
				<5	945 mg/L	107	84.8	115
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4682327)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	98.4	88.0	112
				<5	1000 mg/L	93.0	88.0	112
				<5	945 mg/L	108	84.8	115
ED037P: Alkalinity by PC Titrator (QCLot: 4680205)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	111	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 4680207)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	113	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 4680214)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	105	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 4680218)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	105	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 4681084)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	100	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680228)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	85.0	118
				<1	100 mg/L	91.8	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680229)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	85.0	118
				<1	100 mg/L	90.7	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680230)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.0	85.0	118
				<1	100 mg/L	91.5	85.0	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680234)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.3	85.0	118
				<1	100 mg/L	91.9	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680489)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.2	85.0	118
				<1	100 mg/L	94.5	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 4680225)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.2	90.0	115
				<1	1000 mg/L	98.9	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 4680226)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.1	90.0	115
				<1	1000 mg/L	99.1	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 4680227)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.0	90.0	115
				<1	1000 mg/L	98.8	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 4680233)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.0	90.0	115
				<1	1000 mg/L	98.4	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 4680488)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.0	90.0	115
				<1	1000 mg/L	105	90.0	115
ED093F: Dissolved Major Cations (QCLot: 4698693)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.0	70.0	130
ED093F: Dissolved Major Cations (QCLot: 4698698)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	106	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	70.0	130
ED093F: Dissolved Major Cations (QCLot: 4698699)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	108	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.8	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4682575)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	112	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	118	82.0	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 4683238)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 4683239)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 4684414)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	106	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 4685239)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	103	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 4680204)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	103	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 4680210)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	99.8	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 4680213)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	104	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 4680217)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	97.4	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 4681088)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	100	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4686355)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	96.3	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4686357)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	94.7	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4686359)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	97.0	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680219)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	94.0	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680220)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	95.1	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680221)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	93.1	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680232)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	93.0	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680487)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680487) - continued								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	94.6	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4686356)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	90.2	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4686358)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	92.1	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4686360)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	90.4	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680222)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	91.9	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680223)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.8	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680224)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	94.6	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680231)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	96.9	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680490)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	94.0	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4685573)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	98.7	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	92.3	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	107	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	93.2	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	92.3	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	86.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4685574)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	96.4	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	91.5	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	104	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	94.5	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	97.0	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	91.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4685575)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	106	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	117	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	107	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	127	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	78.0	65.0	140

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4685575) - continued								
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	93.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4685573)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	101	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	89.2	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	109	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	96.0	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	98.4	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	87.6	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	94.4	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	91.6	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	93.6	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	92.0	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	93.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4685574)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	100	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	82.4	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	98.0	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	100	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	91.2	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	85.2	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	85.6	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	84.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	94.4	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	82.0	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	82.7	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4685575)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	105	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	103	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	122	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	111	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	111	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	111	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	110	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	106	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	108	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	91.6	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	91.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4685573)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4685573) - continued								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	96.0	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	86.4	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	85.1	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	93.4	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	87.5	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	114	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	92.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4685574)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	97.2	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	96.3	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	110	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	94.1	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	102	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	94.8	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	88.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4685575)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	102	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	125	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	114	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	113	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	96.6	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	123	65.0	136

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4685575) - continued								
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	114	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4685573)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	94.5	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	101	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	101	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	122	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4685574)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	104	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	87.6	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	99.2	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	104	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4685575)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	100	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	100	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	99.6	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	73.8	53.1	133
EP231P: PFAS Sums (QCLot: 4685573)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 4685574)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 4685575)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680228)							
EB2232616-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	70.6	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680229)							
EB2232600-039	BD02_2510	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680230)							
EB2232600-024	MW69	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	74.8	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680234)							
EB2232600-015	RN13030692	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	103	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680489)							
EB2232538-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4680225)							
EB2232616-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	79.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4680226)							
EB2232600-039	BD02_2510	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4680227)							
EB2232600-024	MW69	ED045G: Chloride	16887-00-6	400 mg/L	98.5	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4680233)							
EB2232600-015	RN13030692	ED045G: Chloride	16887-00-6	400 mg/L	107	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4680488)							
EB2232538-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	78.6	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4682575)							
EB2232409-001	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	115	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4683238)							
EB2232535-002	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	98.2	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4683239)							
EB2232600-013	SW36	EG020A-T: Manganese	7439-96-5	1 mg/L	96.6	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4684414)							
EB2232600-040	BD03_2710	EG020A-T: Manganese	7439-96-5	1 mg/L	107	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4685239)							
ET2205764-001	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	92.7	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4680204)							
EB2232600-016	DRD	EK040P: Fluoride	16984-48-8	5 mg/L	84.4	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK040P: Fluoride by PC Titrator (QCLot: 4680210)							
EB2232600-031	RN13030698	EK040P: Fluoride	16984-48-8	5 mg/L	96.9	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4680213)							
EB2232600-022	MW70	EK040P: Fluoride	16984-48-8	5 mg/L	97.4	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4680217)							
EB2232600-035	MW32	EK040P: Fluoride	16984-48-8	5 mg/L	81.7	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4681088)							
EB2232592-001	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	95.2	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4686355)							
EB2232600-002	SW43	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	94.9	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4686357)							
EB2232600-022	MW70	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	96.6	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680219)							
EB2232616-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	104	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680220)							
EB2232600-039	BD02_2510	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	110	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680221)							
EB2232600-024	MW69	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	96.9	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680232)							
EB2232600-015	RN13030692	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	97.1	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680487)							
EB2232538-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	94.0	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4686356)							
EB2232600-002	SW43	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	88.5	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4686358)							
EB2232600-022	MW70	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.6	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680222)							
EB2232616-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	87.6	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680223)							
EB2232600-039	BD02_2510	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	116	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680224)							
EB2232600-024	MW69	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	90.7	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680231)							
EB2232600-015	RN13030692	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	98.8	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680490)							
EB2232538-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	90.9	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4685573)							
EB2232600-002	SW43	EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00355 µg/L	109	70.0	130
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00376 µg/L	91.9	70.0	130
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00379 µg/L	118	70.0	130
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00381 µg/L	97.0	70.0	130
		EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00371 µg/L	100	70.0	130
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00385 µg/L	92.7	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4685573)							
EB2232600-002	SW43	EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.02 µg/L	100	70.0	130
		EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.004 µg/L	88.5	70.0	130
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.004 µg/L	113	70.0	130
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.004 µg/L	102	70.0	130
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.004 µg/L	98.9	70.0	130
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.004 µg/L	92.0	70.0	130
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.004 µg/L	102	70.0	130
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.004 µg/L	92.4	70.0	130
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.004 µg/L	97.2	70.0	130
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.004 µg/L	96.8	70.0	130
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.01 µg/L	95.0	70.0	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4685573)							
EB2232600-002	SW43	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.004 µg/L	96.8	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.01 µg/L	107	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.01 µg/L	98.2	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.01 µg/L	99.3	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.01 µg/L	98.5	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.004 µg/L	106	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.004 µg/L	96.8	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4685573)							
EB2232600-002	SW43	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00374 µg/L	113	70.0	130
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0038 µg/L	102	70.0	130
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00384 µg/L	99.5	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4685573) - continued							
EB2232600-002	SW43	EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00386 µg/L	73.0	70.0	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2232600-AB**	Page	: 1 of 6
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 03-Nov-2022
Order number	: ----	Date Analysis Commenced	: 03-Nov-2022
C-O-C number	:	Issue Date	: 23-Nov-2022
Sampler	: MICHAEL KOWALCZYK		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
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ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	2IC Organic Chemist	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4680211)									
EB2232600-020	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.68	7.65	0.4	0% - 20%
EB2232600-030	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.56	7.54	0.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4680212)									
EB2232600-020	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	8320	8320	0.0	0% - 20%
EB2232600-030	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1640	1650	0.5	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4680746)									
EB2232600-016	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	7380	7390	0.1	0% - 20%
EB2232600-025	L005-B01	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	975	994	2.0	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4682326)									
EB2232600-018	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	12	10	14.0	No Limit
EB2232600-028	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	6	6	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4680214)									
EB2232600-020	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	637	630	1.2	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	637	630	1.2	0% - 20%
EB2232600-030	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	147	147	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	147	147	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4680230)									
EB2232600-021	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	177	176	0.0	0% - 20%
EB2232600-040	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	60	60	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 4680227)									
EB2232600-021	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2830	2880	1.8	0% - 20%
EB2232600-040	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	352	350	0.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4698699)									
EB2232600-021	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	637	628	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	556	530	4.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	353	342	3.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EB2232600-030	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	130	131	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	70	70	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	98	96	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4683239)									
EB2232600-025	L005-B01	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4680213)									
EB2232600-020	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.6	0.6	0.0	No Limit
EB2232600-030	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4686357)									
EB2232600-021	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.0	No Limit
EB2232600-031	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4680221)									
EB2232600-021	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.15	0.15	0.0	0% - 50%
EB2232600-040	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4686358)									
EB2232600-021	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.55	0.56	0.0	0% - 20%
EB2232600-031	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	8.52	8.57	0.6	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4680224)									
EB2232600-021	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232600-040	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4680211)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4680212)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	102	90.0	106
				<1	24800 µS/cm	99.4	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4680746)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	104	88.0	112
				<10	2000 mg/L	95.1	80.9	118
				<10	2420 mg/L	101	81.4	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4682326)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	103	88.0	112
				<5	1000 mg/L	92.4	88.0	112
				<5	945 mg/L	107	84.8	115
ED037P: Alkalinity by PC Titrator (QCLot: 4680214)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	105	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680230)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.0	85.0	118
				<1	100 mg/L	91.5	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 4680227)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.0	90.0	115
				<1	1000 mg/L	98.8	90.0	115
ED093F: Dissolved Major Cations (QCLot: 4698699)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	108	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.8	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4683239)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 4680213)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	104	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4686357)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	94.7	83.5	114

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680221)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	93.1	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4686358)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	92.1	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680224)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	94.6	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4685574)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	96.4	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	91.5	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	104	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	94.5	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	97.0	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	91.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4685574)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	100	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	82.4	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	98.0	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	100	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	91.2	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	85.2	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	85.6	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	84.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	94.4	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	82.0	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	82.7	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4685574)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	97.2	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	96.3	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	110	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	94.1	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	102	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	94.8	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	88.4	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4685574)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	104	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	87.6	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	99.2	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	104	53.1	133
EP231P: PFAS Sums (QCLot: 4685574)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680230)							
EB2232600-024	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	74.8	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4680227)							
EB2232600-024	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	98.5	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4683239)							
EB2232600-013	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	96.6	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4680213)							
EB2232600-022	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	97.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4686357)							
EB2232600-022	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	96.6	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680221)							
EB2232600-024	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	96.9	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4686358)							
EB2232600-022	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.6	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680224)							
EB2232600-024	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	90.7	70.0	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2232600-AC**	Page	: 1 of 6
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 03-Nov-2022
Order number	: ----	Date Analysis Commenced	: 03-Nov-2022
C-O-C number	:	Issue Date	: 23-Nov-2022
Sampler	: MICHAEL KOWALCZYK		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
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Signatories

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Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	2IC Organic Chemist	Brisbane Organics, Stafford, QLD

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LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4680215)									
EB2232600-034	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.37	7.45	1.1	0% - 20%
EB2232600-007	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.14	8.11	0.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4680216)									
EB2232600-034	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	531	545	2.5	0% - 20%
EB2232600-007	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	39700	39100	1.4	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4680747)									
EB2232600-036	L006-B05	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1180	1190	1.4	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4682326)									
EB2232600-018	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	12	10	14.0	No Limit
EB2232600-028	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	6	6	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 4680218)									
EB2232600-034	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	157	156	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	157	156	0.0	0% - 20%
EB2232600-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	156	156	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	156	156	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4680228)									
EB2232616-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	26	0.0	0% - 20%
EB2232616-021	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	302	295	2.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4680225)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 4680225) - continued									
EB2232616-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	24	25	0.0	0% - 20%
EB2232616-021	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3120	3340	6.9	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4698699)									
EB2232600-021	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	637	628	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	556	530	4.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	353	342	3.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EB2232600-030	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	130	131	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	70	70	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	98	96	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4684414)									
EB2232600-041	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2232600-017	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.906	0.883	2.6	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.29	0.28	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4680217)									
EB2232600-034	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EB2232600-007	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4686357)									
EB2232600-021	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.0	No Limit
EB2232600-031	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4680219)									
EB2232616-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232616-021	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4686358)									
EB2232600-021	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.55	0.56	0.0	0% - 20%
EB2232600-031	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	8.52	8.57	0.6	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4680222)									
EB2232616-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232616-021	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4680215)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4680216)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	94.2	90.0	106
				<1	24800 µS/cm	97.0	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4680747)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	109	88.0	112
				<10	2000 mg/L	96.5	80.9	118
				<10	2420 mg/L	104	81.4	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4682326)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	103	88.0	112
				<5	1000 mg/L	92.4	88.0	112
				<5	945 mg/L	107	84.8	115
ED037P: Alkalinity by PC Titrator (QCLot: 4680218)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	105	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680228)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	85.0	118
				<1	100 mg/L	91.8	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 4680225)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.2	90.0	115
				<1	1000 mg/L	98.9	90.0	115
ED093F: Dissolved Major Cations (QCLot: 4698699)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	108	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.8	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4684414)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	106	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 4680217)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	97.4	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4686357)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	94.7	83.5	114

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680219)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	94.0	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4686358)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	92.1	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680222)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	91.9	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4685574)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	96.4	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	91.5	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	104	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	94.5	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	97.0	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	91.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4685574)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	100	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	82.4	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	98.0	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	100	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	91.2	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	85.2	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	85.6	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	84.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	94.4	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	82.0	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	82.7	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4685574)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	97.2	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	96.3	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	110	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	94.1	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	102	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	94.8	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	88.4	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4685574)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	104	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	87.6	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	99.2	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	104	53.1	133
EP231P: PFAS Sums (QCLot: 4685574)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4680228)							
EB2232616-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	70.6	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4680225)							
EB2232616-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	79.4	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4684414)							
EB2232600-040	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	107	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4680217)							
EB2232600-035	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	81.7	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4686357)							
EB2232600-022	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	96.6	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4680219)							
EB2232616-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	104	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4686358)							
EB2232600-022	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.6	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4680222)							
EB2232616-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	87.6	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2232600**	Page	: 1 of 29
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 03-Nov-2022
Site	: ----	Issue Date	: 23-Nov-2022
Sampler	: MICHAEL KOWALCZYK	No. of samples received	: 49
Order number	: ----	No. of samples analysed	: 49

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2232600--039	BD02_2510	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2232538--002	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2232600--039	BD02_2510	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
L006-B05,	MW75	----	----	----	03-Nov-2022	01-Nov-2022	**2**
Clear Plastic Bottle - Natural							
PW2,	SW43,	----	----	----	03-Nov-2022	25-Oct-2022	**9**
PW1,	SW34,						
NOTCH-V1,	NOTCH-V2,						
Borrow-Pit-A,	SW13,						
BD01_2510,	BD02_2510						
Clear Plastic Bottle - Natural							
SW32,	SW22,	----	----	----	03-Nov-2022	26-Oct-2022	**8**
SW20,	SW40,						
SW36,	SW02,						
RN13030692,	DRD,						
SW12							
Clear Plastic Bottle - Natural							
ESC4,	MW40,	----	----	----	03-Nov-2022	27-Oct-2022	**7**
MW79,	MW70,						
MW80,	MW69,						
L005-B01,	BD03_2710						
Clear Plastic Bottle - Natural							
MW49		----	----	----	04-Nov-2022	27-Oct-2022	**8**
Clear Plastic Bottle - Natural							
ESC3,	MW31,	----	----	----	03-Nov-2022	28-Oct-2022	**6**
MW11,	MW30						

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA005P: pH by PC Titrator - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	----	----	----	03-Nov-2022	29-Oct-2022	**5**
Clear Plastic Bottle - Natural						
MW32	----	----	----	03-Nov-2022	31-Oct-2022	**3**
EA015: Total Dissolved Solids dried at 180 ± 5 °C						
Clear Plastic Bottle - Natural						
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	----	----	----	04-Nov-2022	01-Nov-2022	**3**
Clear Plastic Bottle - Natural						
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	----	----	----	04-Nov-2022	02-Nov-2022	**2**
Clear Plastic Bottle - Natural						
ESC4, MW49, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	----	----	----	04-Nov-2022	03-Nov-2022	**1**
EA025: Total Suspended Solids dried at 104 ± 2°C						
Clear Plastic Bottle - Natural						
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	----	----	----	04-Nov-2022	01-Nov-2022	**3**
Clear Plastic Bottle - Natural						
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	----	----	----	04-Nov-2022	02-Nov-2022	**2**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA025: Total Suspended Solids dried at 104 ± 2°C - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
ESC4, MW49, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	----	----	----	04-Nov-2022	03-Nov-2022	**1**
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
L006-B05, MW75	----	----	----	14-Nov-2022	08-Nov-2022	**6**
Clear Plastic Bottle - Natural						
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	----	----	----	14-Nov-2022	01-Nov-2022	**13**
Clear Plastic Bottle - Natural						
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	----	----	----	14-Nov-2022	02-Nov-2022	**12**
Clear Plastic Bottle - Natural						
ESC4, MW49, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	----	----	----	14-Nov-2022	03-Nov-2022	**11**
Clear Plastic Bottle - Natural						
ESC3, MW31, MW11, MW30	----	----	----	14-Nov-2022	04-Nov-2022	**10**
Clear Plastic Bottle - Natural						
MW73, RN13030698, MW43, MW72, RN13030126	----	----	----	14-Nov-2022	05-Nov-2022	**9**
Clear Plastic Bottle - Natural						
BD04_2910	----	----	----	15-Nov-2022	05-Nov-2022	**10**
Clear Plastic Bottle - Natural						
MW32	----	----	----	14-Nov-2022	07-Nov-2022	**7**
EK057G: Nitrite as N by Discrete Analyser						

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK057G: Nitrite as N by Discrete Analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	----	----	----	03-Nov-2022	27-Oct-2022	**7**
Clear Plastic Bottle - Natural						
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	----	----	----	03-Nov-2022	28-Oct-2022	**6**
Clear Plastic Bottle - Natural						
ESC4, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	----	----	----	03-Nov-2022	29-Oct-2022	**5**
Clear Plastic Bottle - Natural						
MW49	----	----	----	04-Nov-2022	29-Oct-2022	**6**
Clear Plastic Bottle - Natural						
ESC3, MW31, MW11, MW30	----	----	----	03-Nov-2022	30-Oct-2022	**4**
Clear Plastic Bottle - Natural						
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	----	----	----	03-Nov-2022	31-Oct-2022	**3**
Clear Plastic Bottle - Natural						
MW32	----	----	----	03-Nov-2022	02-Nov-2022	**1**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	----	----	----	03-Nov-2022	27-Oct-2022	**7**
Clear Plastic Bottle - Natural						
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	----	----	----	03-Nov-2022	28-Oct-2022	**6**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK071G: Reactive Phosphorus as P by discrete analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
ESC4, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	----	----	----	03-Nov-2022	29-Oct-2022	**5**
Clear Plastic Bottle - Natural						
MW49	----	----	----	04-Nov-2022	29-Oct-2022	**6**
Clear Plastic Bottle - Natural						
ESC3, MW31, MW11, MW30	----	----	----	03-Nov-2022	30-Oct-2022	**4**
Clear Plastic Bottle - Natural						
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	----	----	----	03-Nov-2022	31-Oct-2022	**3**
Clear Plastic Bottle - Natural						
MW32	----	----	----	03-Nov-2022	02-Nov-2022	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	49	4.08	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Ammonia as N by Discrete analyser	2	41	4.88	5.00	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	2	41	4.88	5.00	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	49	2.04	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**03-Nov-2022**	01-Nov-2022	×
Clear Plastic Bottle - Natural (EA005-P)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**03-Nov-2022**	25-Oct-2022	×
Clear Plastic Bottle - Natural (EA005-P)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**03-Nov-2022**	26-Oct-2022	×
Clear Plastic Bottle - Natural (EA005-P)							
ESC4, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**03-Nov-2022**	27-Oct-2022	×
Clear Plastic Bottle - Natural (EA005-P)							
MW49	**27-Oct-2022**	**----**	----	----	**04-Nov-2022**	27-Oct-2022	×
Clear Plastic Bottle - Natural (EA005-P)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**03-Nov-2022**	28-Oct-2022	×
Clear Plastic Bottle - Natural (EA005-P)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**03-Nov-2022**	29-Oct-2022	×
Clear Plastic Bottle - Natural (EA005-P)							
MW32	**31-Oct-2022**	**----**	----	----	**03-Nov-2022**	31-Oct-2022	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**03-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (EA010-P)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**03-Nov-2022**	22-Nov-2022	✓
Clear Plastic Bottle - Natural (EA010-P)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**03-Nov-2022**	23-Nov-2022	✓
Clear Plastic Bottle - Natural (EA010-P)							
ESC4, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**03-Nov-2022**	24-Nov-2022	✓
Clear Plastic Bottle - Natural (EA010-P)							
MW49	**27-Oct-2022**	**----**	----	----	**04-Nov-2022**	24-Nov-2022	✓
Clear Plastic Bottle - Natural (EA010-P)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**03-Nov-2022**	25-Nov-2022	✓
Clear Plastic Bottle - Natural (EA010-P)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**03-Nov-2022**	26-Nov-2022	✓
Clear Plastic Bottle - Natural (EA010-P)							
MW32	**31-Oct-2022**	**----**	----	----	**03-Nov-2022**	28-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**04-Nov-2022**	08-Nov-2022	✓
Clear Plastic Bottle - Natural (EA015H)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**04-Nov-2022**	01-Nov-2022	×
Clear Plastic Bottle - Natural (EA015H)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**04-Nov-2022**	02-Nov-2022	×
Clear Plastic Bottle - Natural (EA015H)							
ESC4, MW49, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**04-Nov-2022**	03-Nov-2022	×
Clear Plastic Bottle - Natural (EA015H)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**04-Nov-2022**	04-Nov-2022	✓
Clear Plastic Bottle - Natural (EA015H)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**04-Nov-2022**	05-Nov-2022	✓
Clear Plastic Bottle - Natural (EA015H)							
MW32	**31-Oct-2022**	**----**	----	----	**04-Nov-2022**	07-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**04-Nov-2022**	08-Nov-2022	✓
Clear Plastic Bottle - Natural (EA025H)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**04-Nov-2022**	01-Nov-2022	×
Clear Plastic Bottle - Natural (EA025H)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**04-Nov-2022**	02-Nov-2022	×
Clear Plastic Bottle - Natural (EA025H)							
ESC4, MW49, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**04-Nov-2022**	03-Nov-2022	×
Clear Plastic Bottle - Natural (EA025H)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**04-Nov-2022**	04-Nov-2022	✓
Clear Plastic Bottle - Natural (EA025H)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**04-Nov-2022**	05-Nov-2022	✓
Clear Plastic Bottle - Natural (EA025H)							
MW32	**31-Oct-2022**	**----**	----	----	**04-Nov-2022**	07-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**03-Nov-2022**	15-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**03-Nov-2022**	08-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**03-Nov-2022**	09-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
ESC4, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**03-Nov-2022**	10-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
MW49	**27-Oct-2022**	**----**	----	----	**04-Nov-2022**	10-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**03-Nov-2022**	11-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**03-Nov-2022**	12-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
MW32	**31-Oct-2022**	**----**	----	----	**03-Nov-2022**	14-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**03-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**03-Nov-2022**	22-Nov-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**03-Nov-2022**	23-Nov-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
ESC4, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**03-Nov-2022**	24-Nov-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
MW49	**27-Oct-2022**	**----**	----	----	**04-Nov-2022**	24-Nov-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**03-Nov-2022**	25-Nov-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**03-Nov-2022**	26-Nov-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
MW32	**31-Oct-2022**	**----**	----	----	**03-Nov-2022**	28-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**03-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**03-Nov-2022**	22-Nov-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**03-Nov-2022**	23-Nov-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
ESC4, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**03-Nov-2022**	24-Nov-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
MW49	**27-Oct-2022**	**----**	----	----	**04-Nov-2022**	24-Nov-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**03-Nov-2022**	25-Nov-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**03-Nov-2022**	26-Nov-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
MW32	**31-Oct-2022**	**----**	----	----	**03-Nov-2022**	28-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**14-Nov-2022**	08-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**14-Nov-2022**	01-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**14-Nov-2022**	02-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
ESC4, MW49, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**14-Nov-2022**	03-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**14-Nov-2022**	04-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
MW73, RN13030698, MW43, MW72, RN13030126	**29-Oct-2022**	**----**	----	----	**14-Nov-2022**	05-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
BD04_2910	**29-Oct-2022**	**----**	----	----	**15-Nov-2022**	05-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
MW32	**31-Oct-2022**	**----**	----	----	**14-Nov-2022**	07-Nov-2022	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW75	**01-Nov-2022**	**05-Nov-2022**	30-Apr-2023	✓	**05-Nov-2022**	30-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
L006-B05	**01-Nov-2022**	**07-Nov-2022**	30-Apr-2023	✓	**07-Nov-2022**	30-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2	**25-Oct-2022**	**04-Nov-2022**	23-Apr-2023	✓	**04-Nov-2022**	23-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
SW13, BD02_2510	**25-Oct-2022**	**05-Nov-2022**	23-Apr-2023	✓	**05-Nov-2022**	23-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
Borrow-Pit-A, BD01_2510	**25-Oct-2022**	**07-Nov-2022**	23-Apr-2023	✓	**07-Nov-2022**	23-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
SW32, SW40, SW36, RN13030692, DRD	**26-Oct-2022**	**05-Nov-2022**	24-Apr-2023	✓	**05-Nov-2022**	24-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
SW22, SW20, SW02, SW12	**26-Oct-2022**	**07-Nov-2022**	24-Apr-2023	✓	**07-Nov-2022**	24-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW40, MW79, MW69, L005-B01	**27-Oct-2022**	**05-Nov-2022**	25-Apr-2023	✓	**05-Nov-2022**	25-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
ESC4, MW49, MW70, MW80, BD03_2710	**27-Oct-2022**	**07-Nov-2022**	25-Apr-2023	✓	**07-Nov-2022**	25-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW31, MW30	**28-Oct-2022**	**05-Nov-2022**	26-Apr-2023	✓	**05-Nov-2022**	26-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
ESC3, MW11	**28-Oct-2022**	**07-Nov-2022**	26-Apr-2023	✓	**07-Nov-2022**	26-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW73, MW72	**29-Oct-2022**	**05-Nov-2022**	27-Apr-2023	✓	**05-Nov-2022**	27-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
RN13030698, MW43, RN13030126, BD04_2910	**29-Oct-2022**	**07-Nov-2022**	27-Apr-2023	✓	**07-Nov-2022**	27-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW32	**31-Oct-2022**	**07-Nov-2022**	29-Apr-2023	✓	**07-Nov-2022**	29-Apr-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**03-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**03-Nov-2022**	22-Nov-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**03-Nov-2022**	23-Nov-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
ESC4, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**03-Nov-2022**	24-Nov-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
MW49	**27-Oct-2022**	**----**	----	----	**04-Nov-2022**	24-Nov-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**03-Nov-2022**	25-Nov-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**03-Nov-2022**	26-Nov-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
MW32	**31-Oct-2022**	**----**	----	----	**03-Nov-2022**	28-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**08-Nov-2022**	22-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**08-Nov-2022**	23-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
ESC4, MW49, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**08-Nov-2022**	24-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**08-Nov-2022**	25-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**08-Nov-2022**	26-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW32	**31-Oct-2022**	**----**	----	----	**08-Nov-2022**	28-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**03-Nov-2022**	03-Nov-2022	✓
Clear Plastic Bottle - Natural (EK057G)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**03-Nov-2022**	27-Oct-2022	×
Clear Plastic Bottle - Natural (EK057G)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**03-Nov-2022**	28-Oct-2022	×
Clear Plastic Bottle - Natural (EK057G)							
ESC4, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**03-Nov-2022**	29-Oct-2022	×
Clear Plastic Bottle - Natural (EK057G)							
MW49	**27-Oct-2022**	**----**	----	----	**04-Nov-2022**	29-Oct-2022	×
Clear Plastic Bottle - Natural (EK057G)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**03-Nov-2022**	30-Oct-2022	×
Clear Plastic Bottle - Natural (EK057G)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**03-Nov-2022**	31-Oct-2022	×
Clear Plastic Bottle - Natural (EK057G)							
MW32	**31-Oct-2022**	**----**	----	----	**03-Nov-2022**	02-Nov-2022	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**08-Nov-2022**	22-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**08-Nov-2022**	23-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
ESC4, MW49, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**08-Nov-2022**	24-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**08-Nov-2022**	25-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**08-Nov-2022**	26-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
MW32	**31-Oct-2022**	**----**	----	----	**08-Nov-2022**	28-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
L006-B05, MW75	**01-Nov-2022**	**----**	----	----	**03-Nov-2022**	03-Nov-2022	✓
Clear Plastic Bottle - Natural (EK071G)							
PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13, BD01_2510, BD02_2510	**25-Oct-2022**	**----**	----	----	**03-Nov-2022**	27-Oct-2022	×
Clear Plastic Bottle - Natural (EK071G)							
SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**----**	----	----	**03-Nov-2022**	28-Oct-2022	×
Clear Plastic Bottle - Natural (EK071G)							
ESC4, MW40, MW79, MW70, MW80, MW69, L005-B01, BD03_2710	**27-Oct-2022**	**----**	----	----	**03-Nov-2022**	29-Oct-2022	×
Clear Plastic Bottle - Natural (EK071G)							
MW49	**27-Oct-2022**	**----**	----	----	**04-Nov-2022**	29-Oct-2022	×
Clear Plastic Bottle - Natural (EK071G)							
ESC3, MW31, MW11, MW30	**28-Oct-2022**	**----**	----	----	**03-Nov-2022**	30-Oct-2022	×
Clear Plastic Bottle - Natural (EK071G)							
MW73, RN13030698, MW43, MW72, RN13030126, BD04_2910	**29-Oct-2022**	**----**	----	----	**03-Nov-2022**	31-Oct-2022	×
Clear Plastic Bottle - Natural (EK071G)							
MW32	**31-Oct-2022**	**----**	----	----	**03-Nov-2022**	02-Nov-2022	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW75	**01-Nov-2022**	**16-Nov-2022**	30-Apr-2023	✓	**17-Nov-2022**	30-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD02_2510, FB_2510	**25-Oct-2022**	**15-Nov-2022**	23-Apr-2023	✓	**16-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13	**25-Oct-2022**	**16-Nov-2022**	23-Apr-2023	✓	**16-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD01_2510	**25-Oct-2022**	**16-Nov-2022**	23-Apr-2023	✓	**17-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**16-Nov-2022**	24-Apr-2023	✓	**16-Nov-2022**	24-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD03_2710, RB_2710, FB_2710	**27-Oct-2022**	**15-Nov-2022**	25-Apr-2023	✓	**16-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW49	**27-Oct-2022**	**16-Nov-2022**	25-Apr-2023	✓	**16-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW40, MW79, MW70, MW80, MW69, L005-B01	**27-Oct-2022**	**16-Nov-2022**	25-Apr-2023	✓	**17-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB_2810, FB_2810	**28-Oct-2022**	**15-Nov-2022**	26-Apr-2023	✓	**16-Nov-2022**	26-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW31, MW11, MW30	**28-Oct-2022**	**16-Nov-2022**	26-Apr-2023	✓	**17-Nov-2022**	26-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_2910, RB_2910, FB_2910	**29-Oct-2022**	**15-Nov-2022**	27-Apr-2023	✓	**16-Nov-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW73, RN13030698, MW43, MW72, RN13030126	**29-Oct-2022**	**16-Nov-2022**	27-Apr-2023	✓	**17-Nov-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB_3110	**31-Oct-2022**	**15-Nov-2022**	29-Apr-2023	✓	**16-Nov-2022**	29-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW32	**31-Oct-2022**	**16-Nov-2022**	29-Apr-2023	✓	**17-Nov-2022**	29-Apr-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X-SUT)								
L006-B05,	MW75	**01-Nov-2022**	**16-Nov-2022**	30-Apr-2023	✓	**17-Nov-2022**	30-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT)								
BD02_2510,	FB_2510	**25-Oct-2022**	**15-Nov-2022**	23-Apr-2023	✓	**16-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT)								
PW2,	SW43,	**25-Oct-2022**	**16-Nov-2022**	23-Apr-2023	✓	**16-Nov-2022**	23-Apr-2023	✓
PW1,	SW34,							
NOTCH-V1,	NOTCH-V2,							
Borrow-Pit-A,	SW13							
HDPE (no PTFE) (EP231X-SUT)								
BD01_2510		**25-Oct-2022**	**16-Nov-2022**	23-Apr-2023	✓	**17-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT)								
SW32,	SW22,	**26-Oct-2022**	**16-Nov-2022**	24-Apr-2023	✓	**16-Nov-2022**	24-Apr-2023	✓
SW20,	SW40,							
SW36,	SW02,							
RN13030692,	DRD,							
SW12								
HDPE (no PTFE) (EP231X-SUT)								
BD03_2710,	RB_2710,	**27-Oct-2022**	**15-Nov-2022**	25-Apr-2023	✓	**16-Nov-2022**	25-Apr-2023	✓
FB_2710								
HDPE (no PTFE) (EP231X-SUT)								
ESC4,	MW49	**27-Oct-2022**	**16-Nov-2022**	25-Apr-2023	✓	**16-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT)								
MW40,	MW79,	**27-Oct-2022**	**16-Nov-2022**	25-Apr-2023	✓	**17-Nov-2022**	25-Apr-2023	✓
MW70,	MW80,							
MW69,	L005-B01							
HDPE (no PTFE) (EP231X-SUT)								
RB_2810,	FB_2810	**28-Oct-2022**	**15-Nov-2022**	26-Apr-2023	✓	**16-Nov-2022**	26-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT)								
ESC3,	MW31,	**28-Oct-2022**	**16-Nov-2022**	26-Apr-2023	✓	**17-Nov-2022**	26-Apr-2023	✓
MW11,	MW30							
HDPE (no PTFE) (EP231X-SUT)								
BD04_2910,	RB_2910,	**29-Oct-2022**	**15-Nov-2022**	27-Apr-2023	✓	**16-Nov-2022**	27-Apr-2023	✓
FB_2910								
HDPE (no PTFE) (EP231X-SUT)								
MW73,	RN13030698,	**29-Oct-2022**	**16-Nov-2022**	27-Apr-2023	✓	**17-Nov-2022**	27-Apr-2023	✓
MW43,	MW72,							
RN13030126								
HDPE (no PTFE) (EP231X-SUT)								
FB_3110		**31-Oct-2022**	**15-Nov-2022**	29-Apr-2023	✓	**16-Nov-2022**	29-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT)								
MW32		**31-Oct-2022**	**16-Nov-2022**	29-Apr-2023	✓	**17-Nov-2022**	29-Apr-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW75	**01-Nov-2022**	**16-Nov-2022**	30-Apr-2023	✓	**17-Nov-2022**	30-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD02_2510, FB_2510	**25-Oct-2022**	**15-Nov-2022**	23-Apr-2023	✓	**16-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13	**25-Oct-2022**	**16-Nov-2022**	23-Apr-2023	✓	**16-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD01_2510	**25-Oct-2022**	**16-Nov-2022**	23-Apr-2023	✓	**17-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**16-Nov-2022**	24-Apr-2023	✓	**16-Nov-2022**	24-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD03_2710, RB_2710, FB_2710	**27-Oct-2022**	**15-Nov-2022**	25-Apr-2023	✓	**16-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW49	**27-Oct-2022**	**16-Nov-2022**	25-Apr-2023	✓	**16-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW40, MW79, MW70, MW80, MW69, L005-B01	**27-Oct-2022**	**16-Nov-2022**	25-Apr-2023	✓	**17-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB_2810, FB_2810	**28-Oct-2022**	**15-Nov-2022**	26-Apr-2023	✓	**16-Nov-2022**	26-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW31, MW11, MW30	**28-Oct-2022**	**16-Nov-2022**	26-Apr-2023	✓	**17-Nov-2022**	26-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_2910, RB_2910, FB_2910	**29-Oct-2022**	**15-Nov-2022**	27-Apr-2023	✓	**16-Nov-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW73, RN13030698, MW43, MW72, RN13030126	**29-Oct-2022**	**16-Nov-2022**	27-Apr-2023	✓	**17-Nov-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB_3110	**31-Oct-2022**	**15-Nov-2022**	29-Apr-2023	✓	**16-Nov-2022**	29-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW32	**31-Oct-2022**	**16-Nov-2022**	29-Apr-2023	✓	**17-Nov-2022**	29-Apr-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW75	**01-Nov-2022**	**16-Nov-2022**	30-Apr-2023	✓	**17-Nov-2022**	30-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD02_2510, FB_2510	**25-Oct-2022**	**15-Nov-2022**	23-Apr-2023	✓	**16-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13	**25-Oct-2022**	**16-Nov-2022**	23-Apr-2023	✓	**16-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD01_2510	**25-Oct-2022**	**16-Nov-2022**	23-Apr-2023	✓	**17-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**16-Nov-2022**	24-Apr-2023	✓	**16-Nov-2022**	24-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD03_2710, RB_2710, FB_2710	**27-Oct-2022**	**15-Nov-2022**	25-Apr-2023	✓	**16-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW49	**27-Oct-2022**	**16-Nov-2022**	25-Apr-2023	✓	**16-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW40, MW79, MW70, MW80, MW69, L005-B01	**27-Oct-2022**	**16-Nov-2022**	25-Apr-2023	✓	**17-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB_2810, FB_2810	**28-Oct-2022**	**15-Nov-2022**	26-Apr-2023	✓	**16-Nov-2022**	26-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW31, MW11, MW30	**28-Oct-2022**	**16-Nov-2022**	26-Apr-2023	✓	**17-Nov-2022**	26-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_2910, RB_2910, FB_2910	**29-Oct-2022**	**15-Nov-2022**	27-Apr-2023	✓	**16-Nov-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW73, RN13030698, MW43, MW72, RN13030126	**29-Oct-2022**	**16-Nov-2022**	27-Apr-2023	✓	**17-Nov-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB_3110	**31-Oct-2022**	**15-Nov-2022**	29-Apr-2023	✓	**16-Nov-2022**	29-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW32	**31-Oct-2022**	**16-Nov-2022**	29-Apr-2023	✓	**17-Nov-2022**	29-Apr-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW75	**01-Nov-2022**	**16-Nov-2022**	30-Apr-2023	✓	**17-Nov-2022**	30-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD02_2510, FB_2510	**25-Oct-2022**	**15-Nov-2022**	23-Apr-2023	✓	**16-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) PW2, SW43, PW1, SW34, NOTCH-V1, NOTCH-V2, Borrow-Pit-A, SW13	**25-Oct-2022**	**16-Nov-2022**	23-Apr-2023	✓	**16-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD01_2510	**25-Oct-2022**	**16-Nov-2022**	23-Apr-2023	✓	**17-Nov-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW32, SW22, SW20, SW40, SW36, SW02, RN13030692, DRD, SW12	**26-Oct-2022**	**16-Nov-2022**	24-Apr-2023	✓	**16-Nov-2022**	24-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD03_2710, RB_2710, FB_2710	**27-Oct-2022**	**15-Nov-2022**	25-Apr-2023	✓	**16-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW49	**27-Oct-2022**	**16-Nov-2022**	25-Apr-2023	✓	**16-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW40, MW79, MW70, MW80, MW69, L005-B01	**27-Oct-2022**	**16-Nov-2022**	25-Apr-2023	✓	**17-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB_2810, FB_2810	**28-Oct-2022**	**15-Nov-2022**	26-Apr-2023	✓	**16-Nov-2022**	26-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW31, MW11, MW30	**28-Oct-2022**	**16-Nov-2022**	26-Apr-2023	✓	**17-Nov-2022**	26-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_2910, RB_2910, FB_2910	**29-Oct-2022**	**15-Nov-2022**	27-Apr-2023	✓	**16-Nov-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW73, RN13030698, MW43, MW72, RN13030126	**29-Oct-2022**	**16-Nov-2022**	27-Apr-2023	✓	**17-Nov-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB_3110	**31-Oct-2022**	**15-Nov-2022**	29-Apr-2023	✓	**16-Nov-2022**	29-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW32	**31-Oct-2022**	**16-Nov-2022**	29-Apr-2023	✓	**17-Nov-2022**	29-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	10	91	**10.99**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	5	41	**12.20**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	10	81	**12.35**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	9	87	**10.34**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	8	60	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	5	41	**12.20**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	10	86	**11.63**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	2	49	**4.08**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	9	89	**10.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	9	66	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	10	91	**10.99**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	6	58	**10.34**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	5	45	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	9	79	**11.39**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	5	91	**5.49**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	10	81	**12.35**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	10	87	**11.49**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	5	60	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	5	86	**5.81**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	3	49	**6.12**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	10	89	**11.24**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	5	66	**7.58**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	10	91	**10.99**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	9	58	**15.52**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	9	45	**20.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	5	79	**6.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	5	81	**6.17**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	5	87	**5.75**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	5	60	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Major Cations - Dissolved	ED093F	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	5	86	**5.81**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	3	49	**6.12**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	5	66	**7.58**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	5	91	**5.49**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	58	**5.17**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	45	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	5	79	**6.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	2	41	**4.88**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	5	81	**6.17**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	5	60	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	41	**4.88**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	5	86	**5.81**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	49	**2.04**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	5	66	**7.58**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	5	91	**5.49**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	5	79	**6.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

epic ENVIRONMENTAL

3/11/22 0940

Chain of Custody Record

Project No:	8C200153.03	Lab:	ALS
Project/Site:	CALLIDE	Lab Quote No:	BN/344/21-V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au	Date Results Required:	5 day TAT
Phone:	0447 300 420	Sample Disposal After:	
Page:	1 of 2		
Number of Eskies:	6		

Please Split Reports:		SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS
AA	1	PW2	25/10/2022	Water	X	X	X	X	
AA	2	CALLIDE A ESP	25/10/2022	Water	X	X	X	X	
AA	3	PW1	25/10/2022	Water	X	X	X	X	
AA	4	SW34	25/10/2022	Water	X	X	X	X	
AA	5	NOTCH-V1	25/10/2022	Water	X	X	X	X	
AA	6	NOTCH-V2	25/10/2022	Water	X	X	X	X	
AA	7	BORROW PIT-A	25/10/2022	Water	X	X	X	X	
AA	8	SW13	25/10/2022	Water	X	X	X	X	
AA	9	SW32	26/10/2022	Water	X	X	X	X	
AA	10	SW22	26/10/2022	Water	X	X	X	X	
AA	11	SW20	26/10/2022	Water	X	X	X	X	
AA	12	SW40	26/10/2022	Water	X	X	X	X	
AA	13	SW36	26/10/2022	Water	X	X	X	X	
AA	14	SW2	26/10/2022	Water	X	X	X	X	
AA	15	RN13030692	26/10/2022	Water	X	X	X	X	
AA	16	DRD	26/10/2022	Water	X	X	X	X	
AA	17	SW12	26/10/2022	Water	X	X	X	X	
AA	18	ESC4	27/10/2022	Water	X	X	X	X	
AA	19	MW49	27/10/2022	Water	X	X	X	X	
AA	20	MW40	27/10/2022	Water	X	X	X	X	
AA	21	MW79	27/10/2022	Water	X	X	X	X	
AA	22	MW70	27/10/2022	Water	X	X	X	X	
AA	23	MW80	27/10/2022	Water	X	X	X	X	
AA	24	MW69	27/10/2022	Water	X	X	X	X	
AB	25	L005-B01	27/10/2022	Water	X	X	X	X	
AA	26	ESC3	28/10/2022	Water	X	X	X	X	
AA	27	MW31	28/10/2022	Water	X	X	X	X	
AA	28	MW11	28/10/2022	Water	X	X	X	X	
AA	29	MW30	28/10/2022	Water	X	X	X	X	
AA	30	MW73	29/10/2022	Water	X	X	X	X	
AA	31	RN13030698	29/10/2022	Water	X	X	X	X	
AA	32	MW43	29/10/2022	Water	X	X	X	X	
AA	33	MW72	29/10/2022	Water	X	X	X	X	
AA	34	RN13030126	29/10/2022	Water	X	X	X	X	
AA	35	MW32	31/20/2022	Water	X	X	X	X	
AC	36	L006-B05	1/11/2022	Water	X	X	X	X	
AA	37	MW75	1/11/2022	Water	X	X	X	X	
AA	38	BD01_2510	25/10/2022	Water	X	X	X	X	

Potable Water							
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	

| Bore Water | | | | | | |

epic ENVIRONMENTAL

JD 3/11/22 0940

Chain of Custody Record

Project No:	BC200153.03	Lab:	ALS
Project/Site:	CALLIDE	Lab Quote No:	BN/344/21-V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au	Date Results Required:	5 day TAT
Phone:	0447 300 420	Sample Disposal After:	
Page:	2 of 2		
Number of Eskies:	6		

Please Split Reports:		SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS	Potable Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025EL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	SOIL: PFAS (EP231X)	HOLD
AA	39	BD02_2510	25/10/2022	Water	x	x	x	x																			x		
AA	40	BD03_2710	27/10/2022	Water	x	x	x	x																			x		
AA	41	BD04_2910	29/10/2022	Water	x	x	x	x																			x		
AA	42	RB_2710	27/10/2022	Water				x																			x		
AA	43	RB_2810	28/10/2022	Water				x																			x		
AA	44	RB_2910	29/10/2022	Water				x																			x		
AA	45	FB_2510	25/10/2022	Water				x																			x		
AA	46	FB_2710	27/10/2022	Water				x																			x		
AA	47	FB_2810	28/10/2022	Water				x																			x		
AA	48	FB_2910	29/10/2022	Water				x																			x		
AA	49	FB_3110	31/10/2022	Water				x																			x		

Relinquished By:	Received By	Custody Seals Intact	Y N
Emily Maddison		Samples Received Chilled	Y N
0407 611 133 01-Nov-22	SIGNATURE DATE	Method of Shipment	

NOTES: Please report with CS Energy EDD format; ENVNC_V4

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2232870**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: k.hiltonbarber@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BC200153.03 CALLIDE	Page	: 1 of 5
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Callide		
Sampler	: MICHAEL KOWALCZYK		

Dates

Date Samples Received	: 08-Nov-2022 10:00	Issue Date	: 10-Nov-2022
Client Requested Due Date	: 22-Nov-2022	Scheduled Reporting Date	: **22-Nov-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 3.1<->9.2°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 22 / 22

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **10/11/22: SRN has been resent to acknowledge the correction of sample IDs. For any further information regarding these adjustments please contact client services at ALSEnviro.Brisbane@alsglobal.com.**
- *Samples were originally received by ALS Gladstone on 07/11/2022 and have been forwarded to ALS Brisbane for analysis. Temperature on arrival in ALS Brisbane has been noted above.
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **Samples "SD05 and SD06" has been forwarded to Eurofins , as requested. Please note that this will incur a freight forwarding fee.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK071G Reactive Phosphorus by Discrete analyser	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-04 Nitrite and Nitrate
EB2232870-001	01-Nov-2022 00:00	SW44	✓	✓	✓	✓	✓	✓	✓
EB2232870-002	01-Nov-2022 00:00	SW42	✓	✓	✓	✓	✓	✓	✓
EB2232870-003	02-Nov-2022 00:00	MW77	✓	✓	✓	✓	✓	✓	✓
EB2232870-004	02-Nov-2022 00:00	SW41	✓	✓	✓	✓	✓	✓	✓
EB2232870-005	02-Nov-2022 00:00	MW68	✓	✓	✓	✓	✓	✓	✓
EB2232870-006	02-Nov-2022 00:00	MW76	✓	✓	✓	✓	✓	✓	✓
EB2232870-007	02-Nov-2022 00:00	MW74	✓	✓	✓	✓	✓	✓	✓
EB2232870-008	02-Nov-2022 00:00	MW56	✓	✓	✓	✓	✓	✓	✓
EB2232870-009	03-Nov-2022 00:00	MW09	✓	✓	✓	✓	✓	✓	✓
EB2232870-010	03-Nov-2022 00:00	RN13030127	✓	✓	✓	✓	✓	✓	✓
EB2232870-011	03-Nov-2022 00:00	L012-B01	✓	✓	✓	✓	✓	✓	✓
EB2232870-012	03-Nov-2022 00:00	RN13030697	✓	✓	✓	✓	✓	✓	✓
EB2232870-013	03-Nov-2022 00:00	SW37	✓	✓	✓	✓	✓	✓	✓
EB2232870-014	03-Nov-2022 00:00	L021-B01	✓	✓	✓	✓	✓	✓	✓
EB2232870-015	03-Nov-2022 00:00	MW78	✓	✓	✓	✓	✓	✓	✓
EB2232870-016	04-Nov-2022 00:00	MW01	✓	✓	✓	✓	✓	✓	✓
EB2232870-017	02-Nov-2022 00:00	BD05_0211	✓	✓	✓	✓	✓	✓	✓
EB2232870-018	02-Nov-2022 00:00	BD06_0211	✓	✓	✓	✓	✓	✓	✓
EB2232870-019	02-Nov-2022 00:00	FB_0211						✓	
EB2232870-020	02-Nov-2022 00:00	RB_0211						✓	
EB2232870-021	04-Nov-2022 00:00	FB_0411						✓	
EB2232870-022	04-Nov-2022 00:00	RB_0411						✓	

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EA025LL Suspended Solids - Low Level	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
EB2232870-001	01-Nov-2022 00:00	SW44	✓	✓	✓
EB2232870-002	01-Nov-2022 00:00	SW42	✓	✓	✓
EB2232870-003	02-Nov-2022 00:00	MW77	✓	✓	✓
EB2232870-004	02-Nov-2022 00:00	SW41	✓	✓	✓
EB2232870-005	02-Nov-2022 00:00	MW68	✓	✓	✓
EB2232870-006	02-Nov-2022 00:00	MW76	✓	✓	✓
EB2232870-007	02-Nov-2022 00:00	MW74	✓	✓	✓
EB2232870-008	02-Nov-2022 00:00	MW56	✓	✓	✓
EB2232870-009	03-Nov-2022 00:00	MW09	✓	✓	✓
EB2232870-010	03-Nov-2022 00:00	RN13030127	✓	✓	✓
EB2232870-011	03-Nov-2022 00:00	L012-B01	✓	✓	✓
EB2232870-012	03-Nov-2022 00:00	RN13030697	✓	✓	✓
EB2232870-013	03-Nov-2022 00:00	SW37	✓	✓	✓
EB2232870-014	03-Nov-2022 00:00	L021-B01	✓	✓	✓
EB2232870-015	03-Nov-2022 00:00	MW78	✓	✓	✓
EB2232870-016	04-Nov-2022 00:00	MW01	✓	✓	✓
EB2232870-017	02-Nov-2022 00:00	BD05_0211	✓	✓	✓
EB2232870-018	02-Nov-2022 00:00	BD06_0211	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

CS ENERGY ENVIRONMENTAL DATA		
- *AU Certificate of Analysis - NATA (COA)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	CSEnergyEnvironmentData@csenergy.com.au
- Chain of Custody (CoC) (COC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ESDAT (ESDAT)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - XTab (XTAB)	Email	CSEnergyEnvironmentData@csenergy.com.au
EPIC		
- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au
- EDI Format - XTab (XTAB)	Email	epicenvironmental@esdat.com.au
INVOICES		
- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au
LABS		
- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	labs@epicenvironmental.com.au
LUKE AMIES		
- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au
MICHAEL KOWALCZYK		
- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au

MICHAEL KOWALCZYK

- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au
Phone:	0447 300 420
Page:	1 of 1
Number of Eskies:	3

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

	Please Split Reports:	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS
1	AA	CALLIDE A NSP	11/01/2022 0:00	Water	x	x	x	x	
2	AA	SW42	11/01/2022 0:00	Water	x	x	x	x	
3	AA	MW77	11/02/2022 0:00	Water	x	x	x	x	
4	AA	SW41	11/02/2022 0:00	Water	x	x	x	x	
5	AA	MW68	11/02/2022 0:00	Water	x	x	x	x	
6	AA	MW76	11/02/2022 0:00	Water	x	x	x	x	
7	AA	MW74	11/02/2022 0:00	Water	x	x	x	x	
8	AA	MW56	11/02/2022 0:00	Water	x	x	x	x	
9	AA	MW09	11/03/2022 0:00	Water	x	x	x	x	
10	AA	RN13030127	11/03/2022 0:00	Water	x	x	x	x	
11	AB	L012-B01	11/03/2022 0:00	Water	x	x	x	x	
12	AA	RN13030697	11/03/2022 0:00	Water	x	x	x	x	
13	AA	SW37	11/03/2022 0:00	Water	x	x	x	x	
14	AC	L021-B01	11/03/2022 0:00	Water	x	x	x	x	
15	AA	MW78	11/03/2022 0:00	Water	x	x	x	x	
16	AA	MW1	11/04/2022 0:00	Water	x	x	x	x	
17	AA	BD05_0211	11/02/2022 0:00	Water	x	x	x	x	
18	AA	BD06_0211	11/02/2022 0:00	Water	x	x	x	x	
19	AA	FB_0211	11/02/2022 0:00	Water				x	
20	AA	RB_0211	11/02/2022 0:00	Water				x	
21	AA	FB_0411	11/04/2022 0:00	Water				x	
22	AA	RB_0411	11/04/2022 0:00	Water				x	
					18	18	18	22	

Potable Water							
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	
18	18	18	18	18	18	18	

| Bore Water | | | | | | |

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2232870**	Page	: 1 of 21
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03 CALLIDE	Date Samples Received	: 08-Nov-2022 10:00
Order number	: ----	Date Analysis Commenced	: 08-Nov-2022
C-O-C number	: ----	Issue Date	: 24-Nov-2022 17:20
Sampler	: MICHAEL KOWALCZYK		
Site	: Callide		
Quote number	: BN/344/21 V3		
No. of samples received	: 22		
No. of samples analysed	: 22		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- The presence of high SO4 may bias the EC low.
- Ionic Balance out of acceptable limits for some samples due to analytes not quantified in this report.
- EP231X-SUT PFAS Super Ultra Trace: The LOR of particular analytes have been raised due to sample matrix interferences.
- EP231X-SUT PFAS Super Ultra Trace: Whole bottle extraction was not possible for particular samples. Samples required dilution prior to extraction due to matrix interference (High Sediment) LOR values have been adjusted accordingly.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SW44	SW42	MW77	SW41	MW68
			Sampling date / time	01-Nov-2022 00:00	01-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232870-001	EB2232870-002	EB2232870-003	EB2232870-004	EB2232870-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.68	8.25	7.27	8.14	7.30
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	92	2900	13900	667	9750
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	116	2040	9720	372	6080
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	17	8	2	1	6
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	28	464	645	183	703
Total Alkalinity as CaCO3	----	1	mg/L	28	464	645	183	703
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	11	762	1630	8	749
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	292	4260	116	2820
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	4	122	376	38	236
Magnesium	7439-95-4	1	mg/L	3	131	576	20	372
Sodium	7440-23-5	1	mg/L	4	304	1680	67	1140
Potassium	7440-09-7	1	mg/L	6	2	2	3	1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.068	0.101	0.542	0.026	0.300
Iron	7439-89-6	0.05	mg/L	0.73	0.18	<0.05	0.06	0.14
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2	1.4	0.3	0.2	0.5
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.01	0.13	0.04	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.01	<0.01	<0.01	0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW44	SW42	MW77	SW41	MW68
				Sampling date / time	01-Nov-2022 00:00	01-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232870-001	EB2232870-002	EB2232870-003	EB2232870-004	EB2232870-005
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.01**	<0.01	<0.01	**0.01**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.11**	<0.01	**0.02**	**0.01**	**0.04**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.90**	**33.4**	**167**	**7.10**	**109**
ø Total Cations	----	0.01	meq/L		**0.77**	**30.1**	**139**	**6.53**	**92.0**
ø Ionic Balance	----	0.01	%		**----**	**5.08**	**9.04**	**4.12**	**8.54**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0120	**0.0104**	**0.0039**	<0.0100	**0.0475**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0050	<0.0040	<0.0015	<0.0025	**0.0392**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0354**	**0.0172**	**0.0074**	**0.0207**	**0.232**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0030	<0.0008	<0.0008	<0.0011	**0.0118**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0313**	<0.0062	<0.0026	**0.0242**	**0.284**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0008	<0.0008	<0.0008	<0.0005	<0.0008
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0040	<0.0040	<0.0040	<0.0020	<0.0039
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0008	<0.0030	<0.0008	**0.0046**	<0.0008
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0020	<0.0025	<0.0008	<0.0020	<0.0008
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0040	<0.0025	<0.0008	<0.0005	<0.0008
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0084**	<0.0008	<0.0008	<0.0005	<0.0008
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		**0.0025**	<0.0008	<0.0008	<0.0005	<0.0008
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		**0.0022**	<0.0008	<0.0008	<0.0005	<0.0008
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0008	<0.0008	<0.0008	<0.0005	<0.0008
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0008	<0.0008	<0.0008	<0.0005	<0.0008
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0008	<0.0008	<0.0008	<0.0005	<0.0008

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW44	SW42	MW77	SW41	MW68
				Sampling date / time	01-Nov-2022 00:00	01-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232870-001	EB2232870-002	EB2232870-003	EB2232870-004	EB2232870-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0020	<0.0020	<0.0020	<0.0008	<0.0020
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0008	<0.0008	<0.0008	<0.0005	<0.0008
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.002	<0.002	<0.002	<0.001	<0.002
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.002	<0.002	<0.002	<0.001	<0.002
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.002	<0.002	<0.002	<0.001	<0.002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.002	<0.002	<0.002	<0.001	<0.002
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0008	<0.0008	<0.0008	<0.0005	<0.0008
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0008	<0.0008	<0.0008	<0.0005	<0.0008
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	**0.002**	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0667**	**0.0172**	**0.0074**	**0.0449**	**0.516**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0751**	**0.0276**	**0.0133**	**0.0495**	**0.564**
^ Sum of PFAS	----	0.0002	µg/L		**0.0798**	**0.0276**	**0.0133**	**0.0495**	**0.614**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**95.1**	**107**	**113**	**102**	**104**
13C8-PFOA	----	0.0005	%		**93.2**	**96.7**	**98.3**	**97.0**	**95.8**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**SW44**	**SW42**	**MW77**	**SW41**	**MW68**
			Sampling date / time	01-Nov-2022 00:00	01-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**EB2232870-001**	**EB2232870-002**	**EB2232870-003**	**EB2232870-004**	**EB2232870-005**
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued								

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	MW76	MW74	MW56	MW09	RN13030127
				Sampling date / time	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00
					EB2232870-006	EB2232870-007	EB2232870-008	EB2232870-009	EB2232870-010
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.86**	**7.66**	**7.55**	**7.35**	**7.40**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**9240**	**2830**	**10500**	**16700**	**882**
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**6910**	**1700**	**6630**	**10600**	**513**
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L		**33**	**13**	<1	**17**	**41**
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**133**	**988**	**702**	**577**	**167**
Total Alkalinity as CaCO3	----	1	mg/L		**133**	**988**	**702**	**577**	**167**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2470**	**238**	**731**	**2150**	**5**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1820**	**281**	**3140**	**4470**	**202**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**658**	**45**	**261**	**331**	**44**
Magnesium	7439-95-4	1	mg/L		**325**	**52**	**346**	**640**	**34**
Sodium	7440-23-5	1	mg/L		**819**	**482**	**1300**	**1970**	**67**
Potassium	7440-09-7	1	mg/L		**19**	**5**	<1	<1	<1
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		**2.29**	**0.042**	**0.002**	**0.284**	**1.62**
Iron	7439-89-6	0.05	mg/L		**5.43**	**0.65**	<0.05	**0.37**	**22.4**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**9.0**	**1.2**	**0.3**	**0.8**	**0.4**
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.23**	**0.01**	<0.01	<0.01	**0.14**
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	<0.01	**1.72**	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW76	MW74	MW56	MW09	RN13030127
				Sampling date / time	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232870-006	EB2232870-007	EB2232870-008	EB2232870-009	EB2232870-010
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	**1.72**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.08**	<0.01	**0.02**	**0.05**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**105**	**32.6**	**118**	**182**	**9.14**
ø Total Cations	----	0.01	meq/L		**95.7**	**27.6**	**98.0**	**155**	**7.91**
ø Ionic Balance	----	0.01	%		**4.84**	**8.30**	**9.16**	**8.15**	**7.22**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0040	**0.107**	**0.0518**	**0.0199**	**0.0042**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0008	**0.0373**	**0.0458**	<0.0055	**0.0059**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0008	**0.130**	**0.290**	**0.0264**	**0.0530**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0008	<0.0045	**0.0224**	<0.0015	<0.0015
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0008	**0.0204**	**0.795**	**0.0249**	**0.0098**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0008	<0.0008	<0.0032	<0.0008	<0.0008
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.0288**	**0.265**	<0.0160	<0.0040	<0.0040
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0008	**0.346**	<0.0032	<0.0008	<0.0008
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0008	**0.0444**	<0.0032	<0.0008	<0.0008
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0016**	**0.128**	<0.0032	<0.0008	<0.0008
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0008	**0.0113**	<0.0032	<0.0008	<0.0008
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0008	<0.0008	<0.0032	<0.0008	<0.0008
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0008	<0.0008	<0.0032	<0.0008	<0.0008
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0008	<0.0008	<0.0032	<0.0008	<0.0008
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0008	<0.0008	<0.0032	<0.0008	<0.0008
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0008	<0.0008	<0.0032	<0.0008	<0.0008

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW76	MW74	MW56	MW09	RN13030127
				Sampling date / time	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232870-006	EB2232870-007	EB2232870-008	EB2232870-009	EB2232870-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0020	<0.0020	<0.0080	<0.0020	<0.0020
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0008	<0.0008	<0.0032	<0.0008	<0.0008
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.002	<0.002	<0.008	<0.002	<0.002
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.002	<0.002	<0.008	<0.002	<0.002
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.002	<0.002	<0.008	<0.002	<0.002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.002	<0.002	<0.008	<0.002	<0.002
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0008	<0.0008	<0.0032	<0.0008	<0.0008
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0008	<0.0008	<0.0032	<0.0008	<0.0008
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.003	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.017**	**0.050**	<0.003	**0.002**	**0.096**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.003	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.003	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0008	**0.150**	**1.08**	**0.0513**	**0.0628**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0474**	**1.10**	**1.14**	**0.0732**	**0.163**
^ Sum of PFAS	----	0.0002	µg/L		**0.0474**	**1.14**	**1.20**	**0.0732**	**0.169**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**99.9**	**86.0**	**116**	**85.8**	**95.5**
13C8-PFOA	----	0.0005	%		**97.2**	**98.6**	**96.9**	**96.4**	**89.4**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**MW76**	**MW74**	**MW56**	**MW09**	**RN13030127**
			Sampling date / time	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**EB2232870-006**	**EB2232870-007**	**EB2232870-008**	**EB2232870-009**	**EB2232870-010**
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	L012-B01	RN13030697	SW37	L021-B01	MW78
			Sampling date / time	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232870-011	EB2232870-012	EB2232870-013	EB2232870-014	EB2232870-015
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.03	7.56	7.95	7.45	7.80
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1470	1320	2560	470	11700
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	979	732	1480	261	7190
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	179	164	<1	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	186	395	447	142	656
Total Alkalinity as CaCO3	----	1	mg/L	186	395	447	142	656
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	94	5	106	8	1530
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	348	226	600	60	2890
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	100	96	81	23	100
Magnesium	7439-95-4	1	mg/L	48	25	78	12	280
Sodium	7440-23-5	1	mg/L	98	112	304	49	2020
Potassium	7440-09-7	1	mg/L	2	7	6	<1	1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.011	6.05	2.53	0.002	0.055
Iron	7439-89-6	0.05	mg/L	<0.05	12.3	1.28	<0.05	<0.05
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.4	0.2	1.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	3.50	0.34	<0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.02	0.03	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	0.08	0.14	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L012-B01	RN13030697	SW37	L021-B01	MW78
				Sampling date / time	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232870-011	EB2232870-012	EB2232870-013	EB2232870-014	EB2232870-015
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.02**	**0.11**	**0.14**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.09**	<0.01	**0.01**	**0.01**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**15.5**	**14.4**	**28.1**	**4.70**	**126**
ø Total Cations	----	0.01	meq/L		**13.2**	**11.9**	**23.8**	**4.27**	**116**
ø Ionic Balance	----	0.01	%		**7.78**	**9.41**	**8.14**	**4.79**	**4.36**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0019**	<0.0095	<0.0016	**0.0007**	**0.0186**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0016**	**0.0146**	<0.0016	**0.0012**	**0.0077**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0158**	**0.154**	<0.0016	**0.0123**	**0.0395**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0010	**0.0042**	<0.0016	<0.0005	<0.0015
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0108**	**0.0376**	<0.0016	**0.0568**	**0.0320**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0080	<0.0020	<0.0040
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	**0.0014**	<0.0045	<0.0005	<0.0008
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	**0.0007**	**0.0019**	<0.0005	<0.0008
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	**0.0060**	**0.0027**	<0.0005	<0.0008
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	**0.0017**	<0.0016	<0.0005	<0.0008
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L012-B01	RN13030697	SW37	L021-B01	MW78
				Sampling date / time	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232870-011	EB2232870-012	EB2232870-013	EB2232870-014	EB2232870-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0008	<0.0008	<0.0040	<0.0005	<0.0020
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.002
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.002
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.002
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	**0.314**	<0.002	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0266**	**0.192**	<0.0016	**0.0691**	**0.0715**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0285**	**0.515**	**0.0046**	**0.0698**	**0.0901**
^ Sum of PFAS	----	0.0002	µg/L		**0.0301**	**0.534**	**0.0046**	**0.0710**	**0.0978**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**91.3**	**102**	**92.1**	**105**	**89.8**
13C8-PFOA	----	0.0005	%		**95.8**	**101**	**98.3**	**91.2**	**99.4**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**L012-B01**	**RN13030697**	**SW37**	**L021-B01**	**MW78**
			Sampling date / time	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00	03-Nov-2022 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**EB2232870-011**	**EB2232870-012**	**EB2232870-013**	**EB2232870-014**	**EB2232870-015**
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW01	BD05_0211	BD06_0211	FB_0211	RB_0211
			Sampling date / time	04-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232870-016	EB2232870-017	EB2232870-018	EB2232870-019	EB2232870-020
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.14	7.62	7.42	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	26800	10300	14600	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	16400	6540	9260	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	2	<1	<1	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	720	704	647	----	----
Total Alkalinity as CaCO3	----	1	mg/L	720	704	647	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	591	706	1550	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	8920	3170	4300	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	505	266	382	----	----
Magnesium	7439-95-4	1	mg/L	880	360	574	----	----
Sodium	7440-23-5	1	mg/L	3930	1340	1670	----	----
Potassium	7440-09-7	1	mg/L	15	<1	3	----	----
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	1.70	0.002	0.511	----	----
Iron	7439-89-6	0.05	mg/L	0.93	<0.05	<0.05	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.3	0.3	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.13	<0.01	0.12	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW01	BD05_0211	BD06_0211	FB_0211	RB_0211
				Sampling date / time	04-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232870-016	EB2232870-017	EB2232870-018	EB2232870-019	EB2232870-020
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.03**	**0.03**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**278**	**118**	**166**	----	----
ø Total Cations	----	0.01	meq/L		**269**	**101**	**139**	----	----
ø Ionic Balance	----	0.01	%		**1.71**	**7.75**	**8.99**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0008	**0.0515**	**0.0047**	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0008	**0.0428**	<0.0015	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0008	**0.299**	<0.0065	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0008	**0.0227**	<0.0008	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0014	**0.868**	<0.0016	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0008	<0.0032	<0.0008	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0040	<0.0160	<0.0040	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0022**	<0.0032	<0.0008	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0008**	<0.0032	<0.0008	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0031**	<0.0032	<0.0008	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0008	<0.0032	<0.0008	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0008	<0.0032	<0.0008	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0008	<0.0032	<0.0008	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0008	<0.0032	<0.0008	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0008	<0.0032	<0.0008	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0008	<0.0032	<0.0008	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW01	BD05_0211	BD06_0211	FB_0211	RB_0211
				Sampling date / time	04-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232870-016	EB2232870-017	EB2232870-018	EB2232870-019	EB2232870-020
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0020	<0.0080	<0.0020	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0008	<0.0032	<0.0008	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.002	<0.008	<0.002	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.002	<0.008	<0.002	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.002	<0.008	<0.002	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.002	<0.008	<0.002	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0008	<0.0032	<0.0008	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0008	<0.0032	<0.0008	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.003	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.003	**0.001**	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.003	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.003	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0008	**1.17**	<0.0008	<0.0002	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0061**	**1.22**	**0.0057**	<0.0002	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		**0.0061**	**1.28**	**0.0057**	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**92.6**	**106**	**93.9**	**91.2**	**98.3**
13C8-PFOA	----	0.0005	%		**96.1**	**98.2**	**102**	**98.8**	**102**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	**MW01**	**BD05_0211**	**BD06_0211**	**FB_0211**	**RB_0211**
			Sampling date / time	04-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00	02-Nov-2022 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**EB2232870-016**	**EB2232870-017**	**EB2232870-018**	**EB2232870-019**	**EB2232870-020**
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB_0411	RB_0411	----	----	----
				Sampling date / time	04-Nov-2022 00:00	04-Nov-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2232870-021	EB2232870-022	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0022	<0.0020	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB_0411	RB_0411	----	----	----
				Sampling date / time	04-Nov-2022 00:00	04-Nov-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2232870-021	EB2232870-022	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0002	<0.0002	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**104**	**107**	----	----	----
13C8-PFOA	----	0.0005	%		**101**	**98.5**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2232870**	Page	: 1 of 12
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03 CALLIDE	Date Samples Received	: 08-Nov-2022
Order number	: ----	Date Analysis Commenced	: 08-Nov-2022
C-O-C number	: ----	Issue Date	: 24-Nov-2022
Sampler	: MICHAEL KOWALCZYK		
Site	: Callide		
Quote number	: BN/344/21 V3		
No. of samples received	: 22		
No. of samples analysed	: 22		

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Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4688372)									
EB2233022-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.04	8.03	0.1	0% - 20%
EB2232870-004	SW41	EA005-P: pH Value	----	0.01	pH Unit	8.14	8.18	0.5	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 4688668)									
EB2232870-018	BD06_0211	EA005-P: pH Value	----	0.01	pH Unit	7.42	7.43	0.1	0% - 20%
EB2233111-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.84	7.86	0.3	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 4691518)									
EB2233139-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.45	7.43	0.3	0% - 20%
EB2232870-002	SW42	EA005-P: pH Value	----	0.01	pH Unit	8.25	8.27	0.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4688373)									
EB2233022-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	777	776	0.0	0% - 20%
EB2232870-004	SW41	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	667	663	0.6	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4688669)									
EB2232870-018	BD06_0211	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	14600	14800	1.7	0% - 20%
EB2233111-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	39300	39900	1.5	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4691515)									
EB2233139-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	6200	6210	0.2	0% - 20%
EB2232870-002	SW42	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2900	2910	0.4	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 4688589)									
EB2232870-001	SW44	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	116	110	6.0	0% - 50%
EB2232870-011	L012-B01	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	979	998	1.9	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 4688590)									
EB2232870-001	SW44	EA025LL: Suspended Solids (SS)	----	1	mg/L	17	19	13.6	0% - 50%
EB2232870-011	L012-B01	EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4688374)									
EB2233022-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	280	278	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	280	278	0.7	0% - 20%
EB2232870-004	SW41	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	183	184	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	183	184	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4688672)									
EB2232870-018	BD06_0211	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	647	644	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	647	644	0.5	0% - 20%
EB2233111-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	105	106	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	105	106	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4691517)									
EB2233139-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	281	289	2.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	281	289	2.8	0% - 20%
EB2232870-002	SW42	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	464	463	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	464	463	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4688853)									
EB2233037-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	32	32	0.0	0% - 20%
EB2232870-003	MW77	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1630	1600	1.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4688854)									
EB2232870-015	MW78	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1530	1550	1.4	0% - 20%
EB2233081-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	62	64	2.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4689268)									
EB2233142-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	26	0.0	0% - 20%
EB2232870-002	SW42	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	762	760	0.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4688859)									
EB2233037-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	68	68	0.0	0% - 20%
EB2232870-003	MW77	ED045G: Chloride	16887-00-6	1	mg/L	4260	4340	1.7	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4688860)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 4688860) - continued									
EB2232870-015	MW78	ED045G: Chloride	16887-00-6	1	mg/L	2890	2900	0.5	0% - 20%
EB2233081-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	51	49	2.8	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4689269)									
EB2233149-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	172	171	0.0	0% - 20%
EB2232870-002	SW42	ED045G: Chloride	16887-00-6	1	mg/L	292	293	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4693541)									
EB2232870-016	MW01	ED093F: Calcium	7440-70-2	1	mg/L	505	509	0.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	880	876	0.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3930	3900	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	15	15	0.0	0% - 50%
EB2233082-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4710222)									
EB2232870-002	SW42	ED093F: Calcium	7440-70-2	1	mg/L	122	128	4.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	131	136	3.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	304	315	3.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EB2232870-010	RN13030127	ED093F: Calcium	7440-70-2	1	mg/L	44	43	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	34	34	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	67	69	3.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4691392)									
ET2205776-002	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2232870-002	SW42	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.101	0.102	1.5	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.18	0.18	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4691480)									
EB2232870-016	MW01	EG020A-T: Manganese	7439-96-5	0.001	mg/L	1.70	1.66	2.0	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.93	0.90	2.8	0% - 50%
EB2233039-002	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.09	0.08	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4688375)									
EB2233022-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.9	0.9	0.0	No Limit
EB2232870-004	SW41	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4688670)									
EB2232870-018	BD06_0211	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4691516)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK040P: Fluoride by PC Titrator (QC Lot: 4691516) - continued									
EB2232870-002	SW42	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.4	1.4	0.0	0% - 50%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4689516)									
EB2232835-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.03	0.0	No Limit
EB2232870-010	RN13030127	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.14	0.14	0.0	0% - 50%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4688856)									
EB2233037-006	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232870-003	MW77	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4688857)									
EB2232870-015	MW78	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2233081-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.01	0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4689267)									
EB2233142-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232870-002	SW42	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4689517)									
EB2232835-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	14.5	14.7	1.4	0% - 20%
EB2232870-010	RN13030127	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4688862)									
EB2233037-006	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2232870-003	MW77	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.02	0.02	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4688863)									
EB2232870-015	MW78	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EB2233081-003	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4689266)									
EB2233144-006	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EB2232870-002	SW42	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4688372)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.0	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA005P: pH by PC Titrator (QCLot: 4688668)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.0	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA005P: pH by PC Titrator (QCLot: 4691518)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.8	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4688373)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	96.5	90.0	106
				<1	12890 µS/cm	95.5	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 4688669)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	95.0	90.0	106
				<1	12890 µS/cm	96.4	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 4691515)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	103	90.0	106
				<1	12890 µS/cm	99.0	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4688589)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	107	88.0	112
				<10	2000 mg/L	96.4	80.9	118
				<10	2420 mg/L	101	81.4	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4688590)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	96.5	82.0	120
				<1	945 mg/L	105	84.8	115
ED037P: Alkalinity by PC Titrator (QCLot: 4688374)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	110	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 4688672)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	106	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 4691517)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	110	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4688853)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.8	85.0	118
				<1	100 mg/L	98.3	85.0	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4688854)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	92.0	85.0	118
				<1	100 mg/L	96.4	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4689268)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100.0	85.0	118
				<1	100 mg/L	92.6	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 4688859)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.6	90.0	115
				<1	1000 mg/L	103	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 4688860)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.6	90.0	115
				<1	1000 mg/L	109	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 4689269)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.6	90.0	115
				<1	1000 mg/L	96.6	90.0	115
ED093F: Dissolved Major Cations (QCLot: 4693541)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.3	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.3	70.0	130
ED093F: Dissolved Major Cations (QCLot: 4710222)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	89.8	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	87.3	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	91.6	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	88.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4691392)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	101	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	106	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 4691480)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 4688375)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	99.6	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 4688670)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	10 mg/L	92.1	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 4691516)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	106	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4689516)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4689516) - continued								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	101	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4688856)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	94.3	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4688857)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	95.3	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4689267)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	94.2	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4689517)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.8	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4688862)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.7	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4688863)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	96.7	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4689266)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	97.1	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4688378)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	100	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	115	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	97.5	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	111	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	83.2	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	82.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4704896)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	105	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	98.7	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	93.7	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	92.8	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	72.4	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	98.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4688378)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	93.6	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	102	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	110	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	114	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	98.8	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	115	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	97.2	71.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4688378) - continued								
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	94.0	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	105	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	97.2	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	95.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4704896)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	94.2	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	94.0	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	109	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	100	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	102	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	104	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	88.0	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	92.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	103	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	92.8	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	97.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4688378)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	102	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	97.6	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	91.0	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	95.7	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	93.9	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	105	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	104	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4704896)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	92.0	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	107	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	115	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	98.9	63.3	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4704896) - continued								
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	109	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	93.6	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	90.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4688378)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	106	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	90.5	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	99.2	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	94.9	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4704896)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	113	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	96.4	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	91.2	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	82.1	53.1	133
EP231P: PFAS Sums (QCLot: 4688378)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 4704896)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4688853)							
EB2232700-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	116	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4688854)							
EB2233079-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	88.9	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4689268)							
EB2233126-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	103	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4688859)							
EB2232700-003	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	114	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4688860)							
EB2233079-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	95.2	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4689269)							
EB2233126-003	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	83.6	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4691392)							
ET2205776-001	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	103	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4691480)							
EB2232870-017	BD05_0211	EG020A-T: Manganese	7439-96-5	1 mg/L	105	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4688375)							
EB2232870-005	MW68	EK040P: Fluoride	16984-48-8	5 mg/L	85.1	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4688670)							
EB2232870-016	MW01	EK040P: Fluoride	16984-48-8	5 mg/L	73.4	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4691516)							
EB2233114-001	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	96.6	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4689516)							
EB2232870-001	SW44	EK055G: Ammonia as N	7664-41-7	0.8 mg/L	91.2	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4688856)							
EB2232700-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	110	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4688857)							
EB2233079-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	114	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4689267)							
EB2233126-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	94.0	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4689517)							
EB2232870-001	SW44	EK059G: Nitrite + Nitrate as N	----	0.8 mg/L	88.4	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4688862)							
EB2232700-003	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	113	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4688863)							
EB2233079-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	123	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4689266)							
EB2233126-003	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	90.3	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2232870**	Page	: 1 of 17
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BC200153.03 CALLIDE	Date Samples Received	: 08-Nov-2022
Site	: Callide	Issue Date	: 24-Nov-2022
Sampler	: MICHAEL KOWALCZYK	No. of samples received	: 22
Order number	: ----	No. of samples analysed	: 22

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
SW44	----	----	----	08-Nov-2022	01-Nov-2022	**7**
Clear Plastic Bottle - Natural						
SW42	----	----	----	09-Nov-2022	01-Nov-2022	**8**
Clear Plastic Bottle - Natural						
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	----	----	----	08-Nov-2022	02-Nov-2022	**6**
Clear Plastic Bottle - Natural						
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	----	----	----	08-Nov-2022	03-Nov-2022	**5**
Clear Plastic Bottle - Natural						
MW01	----	----	----	08-Nov-2022	04-Nov-2022	**4**
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
SW44, SW42	----	----	----	21-Nov-2022	08-Nov-2022	**13**
Clear Plastic Bottle - Natural						
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	----	----	----	21-Nov-2022	09-Nov-2022	**12**
Clear Plastic Bottle - Natural						
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	----	----	----	21-Nov-2022	10-Nov-2022	**11**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
SW44	----	----	----	08-Nov-2022	03-Nov-2022	**5**
Clear Plastic Bottle - Natural						
SW42	----	----	----	10-Nov-2022	03-Nov-2022	**7**
Clear Plastic Bottle - Natural						
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	----	----	----	08-Nov-2022	04-Nov-2022	**4**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK057G: Nitrite as N by Discrete Analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	----	----	----	08-Nov-2022	05-Nov-2022	**3**
Clear Plastic Bottle - Natural MW01	----	----	----	08-Nov-2022	06-Nov-2022	**2**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural SW44	----	----	----	08-Nov-2022	03-Nov-2022	**5**
Clear Plastic Bottle - Natural SW42	----	----	----	10-Nov-2022	03-Nov-2022	**7**
Clear Plastic Bottle - Natural MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	----	----	----	08-Nov-2022	04-Nov-2022	**4**
Clear Plastic Bottle - Natural MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	----	----	----	08-Nov-2022	05-Nov-2022	**3**
Clear Plastic Bottle - Natural MW01	----	----	----	08-Nov-2022	06-Nov-2022	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	23	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	23	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) SW44	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	01-Nov-2022	×
Clear Plastic Bottle - Natural (EA005-P) SW42	**01-Nov-2022**	**----**	----	----	**09-Nov-2022**	01-Nov-2022	×
Clear Plastic Bottle - Natural (EA005-P) MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**08-Nov-2022**	02-Nov-2022	×
Clear Plastic Bottle - Natural (EA005-P) MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**08-Nov-2022**	03-Nov-2022	×
Clear Plastic Bottle - Natural (EA005-P) MW01	**04-Nov-2022**	**----**	----	----	**08-Nov-2022**	04-Nov-2022	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) SW44	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (EA010-P) SW42	**01-Nov-2022**	**----**	----	----	**09-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (EA010-P) MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**08-Nov-2022**	30-Nov-2022	✓
Clear Plastic Bottle - Natural (EA010-P) MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**08-Nov-2022**	01-Dec-2022	✓
Clear Plastic Bottle - Natural (EA010-P) MW01	**04-Nov-2022**	**----**	----	----	**08-Nov-2022**	02-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
SW44, SW42	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	08-Nov-2022	✓
Clear Plastic Bottle - Natural (EA015H)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**08-Nov-2022**	09-Nov-2022	✓
Clear Plastic Bottle - Natural (EA015H)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**08-Nov-2022**	10-Nov-2022	✓
Clear Plastic Bottle - Natural (EA015H)							
MW01	**04-Nov-2022**	**----**	----	----	**08-Nov-2022**	11-Nov-2022	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025LL)							
SW44, SW42	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	08-Nov-2022	✓
Clear Plastic Bottle - Natural (EA025LL)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**08-Nov-2022**	09-Nov-2022	✓
Clear Plastic Bottle - Natural (EA025LL)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**08-Nov-2022**	10-Nov-2022	✓
Clear Plastic Bottle - Natural (EA025LL)							
MW01	**04-Nov-2022**	**----**	----	----	**08-Nov-2022**	11-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
SW44	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	15-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
SW42	**01-Nov-2022**	**----**	----	----	**09-Nov-2022**	15-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**08-Nov-2022**	16-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**08-Nov-2022**	17-Nov-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
MW01	**04-Nov-2022**	**----**	----	----	**08-Nov-2022**	18-Nov-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
SW44	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
SW42	**01-Nov-2022**	**----**	----	----	**10-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**08-Nov-2022**	30-Nov-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**08-Nov-2022**	01-Dec-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
MW01	**04-Nov-2022**	**----**	----	----	**08-Nov-2022**	02-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
SW44	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
SW42	**01-Nov-2022**	**----**	----	----	**10-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**08-Nov-2022**	30-Nov-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**08-Nov-2022**	01-Dec-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
MW01	**04-Nov-2022**	**----**	----	----	**08-Nov-2022**	02-Dec-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
SW44, SW42	**01-Nov-2022**	**----**	----	----	**21-Nov-2022**	08-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**21-Nov-2022**	09-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**21-Nov-2022**	10-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
MW01	**04-Nov-2022**	**----**	----	----	**11-Nov-2022**	11-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
SW44, SW42	**01-Nov-2022**	**09-Nov-2022**	30-Apr-2023	✓	**09-Nov-2022**	30-Apr-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**09-Nov-2022**	01-May-2023	✓	**09-Nov-2022**	01-May-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**09-Nov-2022**	02-May-2023	✓	**09-Nov-2022**	02-May-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW01	**04-Nov-2022**	**09-Nov-2022**	03-May-2023	✓	**09-Nov-2022**	03-May-2023	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
SW44	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
SW42	**01-Nov-2022**	**----**	----	----	**09-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**08-Nov-2022**	30-Nov-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**08-Nov-2022**	01-Dec-2022	✓
Clear Plastic Bottle - Natural (EK040P)							
MW01	**04-Nov-2022**	**----**	----	----	**08-Nov-2022**	02-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
SW44, SW42	**01-Nov-2022**	**----**	----	----	**09-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**09-Nov-2022**	30-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**09-Nov-2022**	01-Dec-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW01	**04-Nov-2022**	**----**	----	----	**09-Nov-2022**	02-Dec-2022	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
SW44	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	03-Nov-2022	×
Clear Plastic Bottle - Natural (EK057G)							
SW42	**01-Nov-2022**	**----**	----	----	**10-Nov-2022**	03-Nov-2022	×
Clear Plastic Bottle - Natural (EK057G)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**08-Nov-2022**	04-Nov-2022	×
Clear Plastic Bottle - Natural (EK057G)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**08-Nov-2022**	05-Nov-2022	×
Clear Plastic Bottle - Natural (EK057G)							
MW01	**04-Nov-2022**	**----**	----	----	**08-Nov-2022**	06-Nov-2022	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
SW44, SW42	**01-Nov-2022**	**----**	----	----	**09-Nov-2022**	29-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**09-Nov-2022**	30-Nov-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**09-Nov-2022**	01-Dec-2022	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
MW01	**04-Nov-2022**	**----**	----	----	**09-Nov-2022**	02-Dec-2022	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
SW44	**01-Nov-2022**	**----**	----	----	**08-Nov-2022**	03-Nov-2022	×
Clear Plastic Bottle - Natural (EK071G)							
SW42	**01-Nov-2022**	**----**	----	----	**10-Nov-2022**	03-Nov-2022	×
Clear Plastic Bottle - Natural (EK071G)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211	**02-Nov-2022**	**----**	----	----	**08-Nov-2022**	04-Nov-2022	×
Clear Plastic Bottle - Natural (EK071G)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**----**	----	----	**08-Nov-2022**	05-Nov-2022	×
Clear Plastic Bottle - Natural (EK071G)							
MW01	**04-Nov-2022**	**----**	----	----	**08-Nov-2022**	06-Nov-2022	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) SW44, SW42	**01-Nov-2022**	**18-Nov-2022**	30-Apr-2023	✓	**18-Nov-2022**	30-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211, FB_0211, RB_0211	**02-Nov-2022**	**18-Nov-2022**	01-May-2023	✓	**18-Nov-2022**	01-May-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**18-Nov-2022**	02-May-2023	✓	**18-Nov-2022**	02-May-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW01, FB_0411, RB_0411	**04-Nov-2022**	**18-Nov-2022**	03-May-2023	✓	**18-Nov-2022**	03-May-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) SW44, SW42	**01-Nov-2022**	**18-Nov-2022**	30-Apr-2023	✓	**18-Nov-2022**	30-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211, FB_0211, RB_0211	**02-Nov-2022**	**18-Nov-2022**	01-May-2023	✓	**18-Nov-2022**	01-May-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**18-Nov-2022**	02-May-2023	✓	**18-Nov-2022**	02-May-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW01, FB_0411, RB_0411	**04-Nov-2022**	**18-Nov-2022**	03-May-2023	✓	**18-Nov-2022**	03-May-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) SW44, SW42	**01-Nov-2022**	**18-Nov-2022**	30-Apr-2023	✓	**18-Nov-2022**	30-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211, FB_0211, RB_0211	**02-Nov-2022**	**18-Nov-2022**	01-May-2023	✓	**18-Nov-2022**	01-May-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**18-Nov-2022**	02-May-2023	✓	**18-Nov-2022**	02-May-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW01, FB_0411, RB_0411	**04-Nov-2022**	**18-Nov-2022**	03-May-2023	✓	**18-Nov-2022**	03-May-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) SW44, SW42	**01-Nov-2022**	**18-Nov-2022**	30-Apr-2023	✓	**18-Nov-2022**	30-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211, FB_0211, RB_0211	**02-Nov-2022**	**18-Nov-2022**	01-May-2023	✓	**18-Nov-2022**	01-May-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**18-Nov-2022**	02-May-2023	✓	**18-Nov-2022**	02-May-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW01, FB_0411, RB_0411	**04-Nov-2022**	**18-Nov-2022**	03-May-2023	✓	**18-Nov-2022**	03-May-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT)							
SW44, SW42	**01-Nov-2022**	**18-Nov-2022**	30-Apr-2023	✓	**18-Nov-2022**	30-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT)							
MW77, SW41, MW68, MW76, MW74, MW56, BD05_0211, BD06_0211, FB_0211, RB_0211	**02-Nov-2022**	**18-Nov-2022**	01-May-2023	✓	**18-Nov-2022**	01-May-2023	✓
HDPE (no PTFE) (EP231X-SUT)							
MW09, RN13030127, L012-B01, RN13030697, SW37, L021-B01, MW78	**03-Nov-2022**	**18-Nov-2022**	02-May-2023	✓	**18-Nov-2022**	02-May-2023	✓
HDPE (no PTFE) (EP231X-SUT)							
MW01, FB_0411, RB_0411	**04-Nov-2022**	**18-Nov-2022**	03-May-2023	✓	**18-Nov-2022**	03-May-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	6	51	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	47	**12.77**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	6	46	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	6	47	**12.77**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	23	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	6	45	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	6	37	**16.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	53	**11.32**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	3	51	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	47	**12.77**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	6	46	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	37	**8.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	3	47	**6.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	6	45	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	37	**8.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	53	**11.32**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	18	**16.67**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	3	47	**6.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	3	46	**6.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	37	**8.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Major Cations - Dissolved	ED093F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	3	47	**6.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	37	**8.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	53	**5.66**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	3	47	**6.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	37	**8.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	3	47	**6.38**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	23	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	37	**8.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	53	**5.66**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (Low Level)	EA025LL	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . Extra volume is used to counter the effect from saline water. This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2232870**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: k.hiltonbarber@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BC200153.03 CALLIDE	Page	: 1 of 5
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Callide		
Sampler	: MICHAEL KOWALCZYK		

Dates

Date Samples Received	: 08-Nov-2022 10:00	Issue Date	: 10-Nov-2022
Client Requested Due Date	: 22-Nov-2022	Scheduled Reporting Date	: **22-Nov-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 3	Temperature	: 3.1<->9.2°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 22 / 22

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **10/11/22: SRN has been resent to acknowledge the correction of sample IDs. For any further information regarding these adjustments please contact client services at ALSEnviro.Brisbane@alsglobal.com.**
- *Samples were originally received by ALS Gladstone on 07/11/2022 and have been forwarded to ALS Brisbane for analysis. Temperature on arrival in ALS Brisbane has been noted above.
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **Samples "SD05 and SD06" has been forwarded to Eurofins , as requested. Please note that this will incur a freight forwarding fee.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK071G Reactive Phosphorus by Discrete analyser	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-04 Nitrite and Nitrate
EB2232870-001	01-Nov-2022 00:00	SW44	✓	✓	✓	✓	✓	✓	✓
EB2232870-002	01-Nov-2022 00:00	SW42	✓	✓	✓	✓	✓	✓	✓
EB2232870-003	02-Nov-2022 00:00	MW77	✓	✓	✓	✓	✓	✓	✓
EB2232870-004	02-Nov-2022 00:00	SW41	✓	✓	✓	✓	✓	✓	✓
EB2232870-005	02-Nov-2022 00:00	MW68	✓	✓	✓	✓	✓	✓	✓
EB2232870-006	02-Nov-2022 00:00	MW76	✓	✓	✓	✓	✓	✓	✓
EB2232870-007	02-Nov-2022 00:00	MW74	✓	✓	✓	✓	✓	✓	✓
EB2232870-008	02-Nov-2022 00:00	MW56	✓	✓	✓	✓	✓	✓	✓
EB2232870-009	03-Nov-2022 00:00	MW09	✓	✓	✓	✓	✓	✓	✓
EB2232870-010	03-Nov-2022 00:00	RN13030127	✓	✓	✓	✓	✓	✓	✓
EB2232870-011	03-Nov-2022 00:00	L012-B01	✓	✓	✓	✓	✓	✓	✓
EB2232870-012	03-Nov-2022 00:00	RN13030697	✓	✓	✓	✓	✓	✓	✓
EB2232870-013	03-Nov-2022 00:00	SW37	✓	✓	✓	✓	✓	✓	✓
EB2232870-014	03-Nov-2022 00:00	L021-B01	✓	✓	✓	✓	✓	✓	✓
EB2232870-015	03-Nov-2022 00:00	MW78	✓	✓	✓	✓	✓	✓	✓
EB2232870-016	04-Nov-2022 00:00	MW01	✓	✓	✓	✓	✓	✓	✓
EB2232870-017	02-Nov-2022 00:00	BD05_0211	✓	✓	✓	✓	✓	✓	✓
EB2232870-018	02-Nov-2022 00:00	BD06_0211	✓	✓	✓	✓	✓	✓	✓
EB2232870-019	02-Nov-2022 00:00	FB_0211						✓	
EB2232870-020	02-Nov-2022 00:00	RB_0211						✓	
EB2232870-021	04-Nov-2022 00:00	FB_0411						✓	
EB2232870-022	04-Nov-2022 00:00	RB_0411						✓	

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EA025LL Suspended Solids - Low Level	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
EB2232870-001	01-Nov-2022 00:00	SW44	✓	✓	✓
EB2232870-002	01-Nov-2022 00:00	SW42	✓	✓	✓
EB2232870-003	02-Nov-2022 00:00	MW77	✓	✓	✓
EB2232870-004	02-Nov-2022 00:00	SW41	✓	✓	✓
EB2232870-005	02-Nov-2022 00:00	MW68	✓	✓	✓
EB2232870-006	02-Nov-2022 00:00	MW76	✓	✓	✓
EB2232870-007	02-Nov-2022 00:00	MW74	✓	✓	✓
EB2232870-008	02-Nov-2022 00:00	MW56	✓	✓	✓
EB2232870-009	03-Nov-2022 00:00	MW09	✓	✓	✓
EB2232870-010	03-Nov-2022 00:00	RN13030127	✓	✓	✓
EB2232870-011	03-Nov-2022 00:00	L012-B01	✓	✓	✓
EB2232870-012	03-Nov-2022 00:00	RN13030697	✓	✓	✓
EB2232870-013	03-Nov-2022 00:00	SW37	✓	✓	✓
EB2232870-014	03-Nov-2022 00:00	L021-B01	✓	✓	✓
EB2232870-015	03-Nov-2022 00:00	MW78	✓	✓	✓
EB2232870-016	04-Nov-2022 00:00	MW01	✓	✓	✓
EB2232870-017	02-Nov-2022 00:00	BD05_0211	✓	✓	✓
EB2232870-018	02-Nov-2022 00:00	BD06_0211	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

CS ENERGY ENVIRONMENTAL DATA		
- *AU Certificate of Analysis - NATA (COA)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	CSEnergyEnvironmentData@csenergy.com.au
- Chain of Custody (CoC) (COC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ESDAT (ESDAT)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - XTab (XTAB)	Email	CSEnergyEnvironmentData@csenergy.com.au
EPIC		
- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au
- EDI Format - XTab (XTAB)	Email	epicenvironmental@esdat.com.au
INVOICES		
- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au
LABS		
- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	labs@epicenvironmental.com.au
LUKE AMIES		
- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au
MICHAEL KOWALCZYK		
- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au

MICHAEL KOWALCZYK

- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au
Phone:	0447 300 420
Page:	1 of 1
Number of Eskies:	3

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

	Please Split Reports:	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS
1	AA	CALLIDE A NSP	11/01/2022 0:00	Water	x	x	x	x	
2	AA	SW42	11/01/2022 0:00	Water	x	x	x	x	
3	AA	MW77	11/02/2022 0:00	Water	x	x	x	x	
4	AA	SW41	11/02/2022 0:00	Water	x	x	x	x	
5	AA	MW68	11/02/2022 0:00	Water	x	x	x	x	
6	AA	MW76	11/02/2022 0:00	Water	x	x	x	x	
7	AA	MW74	11/02/2022 0:00	Water	x	x	x	x	
8	AA	MW56	11/02/2022 0:00	Water	x	x	x	x	
9	AA	MW09	11/03/2022 0:00	Water	x	x	x	x	
10	AA	RN13030127	11/03/2022 0:00	Water	x	x	x	x	
11	AB	L012-B01	11/03/2022 0:00	Water	x	x	x	x	
12	AA	RN13030697	11/03/2022 0:00	Water	x	x	x	x	
13	AA	SW37	11/03/2022 0:00	Water	x	x	x	x	
14	AC	L021-B01	11/03/2022 0:00	Water	x	x	x	x	
15	AA	MW78	11/03/2022 0:00	Water	x	x	x	x	
16	AA	MW1	11/04/2022 0:00	Water	x	x	x	x	
17	AA	BD05_0211	11/02/2022 0:00	Water	x	x	x	x	
18	AA	BD06_0211	11/02/2022 0:00	Water	x	x	x	x	
19	AA	FB_0211	11/02/2022 0:00	Water				x	
20	AA	RB_0211	11/02/2022 0:00	Water				x	
21	AA	FB_0411	11/04/2022 0:00	Water				x	
22	AA	RB_0411	11/04/2022 0:00	Water				x	
					18	18	18	22	

Potable Water							
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	
18	18	18	18	18	18	18	

| Bore Water | | | | | | |

HT

epic ENVIRONMENTAL

PLEASE FORWARD TO EUROFINS

Chain of Custody Record

Project No:	BC200153.03	Lab:	Eurofins
Project/Site:	CALLIDE	Lab Quote No:	
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au)	Date Results Required:	
Phone:	0447 300 420	Sample Disposal After:	
Page:	1 OF 1		
Number of Eskies:	1		

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other PFAS Soil	pH	EC	TDS - Standard	Suspended Solids	Ammonia, Nitrate and Nitrite	Reactive P	Major Cations/Anions	PFAS Ultra Low Level		PFAS in soil (28 Analyte)									HOLD
	SD01_2510	25/10/2022	Water	x	x	x	x		x	x	x	x	x	x	x	x											
	SD02_2510	25/10/2022	Water	x	x	x	x		x	x	x	x	x	x	x	x											
	SD03_2710	27/10/2022	Water	x	x	x	x		x	x	x	x	x	x	x	x											
	SD04_2910	29/10/2022	Water	x	x	x	x		x	x	x	x	x	x	x	x											

Relinquished By:
Emily Maddison
0407 611 133
01-Nov-22

Received By Martin 9:30
SIGNATURE DATE 3/11/22

Custody Seals Intact Y N
Samples Received Chilled Y N
Method of Shipment

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

938582

Date/Time: 4/11/22 3:40PM
Chilled: Yes / No
Temp: 11.7 PIT
-0.2
Correction:
Final Temp: 11.5

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

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NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd

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IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Luke Amies
Project name:	CALLIDE
Project ID:	BC200153.03
Turnaround time:	5 Day
Date/Time received	Nov 4, 2022 3:40 PM
Eurofins reference	938582

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Luke Amies - lamies@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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Tel: +61 2 4968 8448
NATA# 1261 Site# 25079

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NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd
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Tel: +64 9 526 45 51
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Project Name: CALLIDE
Project ID: BC200153.03

Order No.:
Report #: 938582
Phone: 0400 497 512
Fax:

Received: Nov 4, 2022 3:40 PM
Due: Nov 11, 2022
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Nitrate (as N)	Nitrite (as N)	pH (at 25 °C)	Phosphorus reactive (as P)	Total Suspended Solids Dried at 103 °C to 105 °C	Eurofins Suite B11E: Cl/SO4/Alkalinity	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X		X	X		X		X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X		X		X		X
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	SD01_2510	Oct 25, 2022		Water	B22-No0014932	X	X	X	X	X	X	X	X	X	X	X
2	SD02_2510	Oct 25, 2022		Water	B22-No0014933	X	X	X	X	X	X	X	X	X	X	X
3	SD03_2710	Oct 27, 2022		Water	B22-No0014934	X	X	X	X	X	X	X	X	X	X	X
4	SD04_2910	Oct 29, 2022		Water	B22-No0014935	X	X	X	X	X	X	X	X	X	X	X
Test Counts						4	4	4	4	4	4	4	4	4	4	4

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Luke Amies**

Report **938582-W**
Project name CALLIDE
Project ID BC200153.03
Received Date Nov 04, 2022

Client Sample ID			**SD01_2510**	**SD02_2510**	**SD03_2710**	**SD04_2910**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**B22-No0014932**	**B22-No0014933**	**B22-No0014934**	**B22-No0014935**
Date Sampled			**Oct 25, 2022**	**Oct 25, 2022**	**Oct 27, 2022**	**Oct 29, 2022**
Test/Reference	LOR	Unit				
Ammonia (as N)	0.01	mg/L	< 0.01	0.01	< 0.01	< 0.01
Chloride	1	mg/L	5000	5700	360	470
Conductivity (at 25 °C)	10	uS/cm	18000	22000	1700	1900
Nitrate (as N)	0.02	mg/L	< 0.02	< 0.02	0.89	9.9
Nitrite (as N)	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
pH (at 25 °C)	0.1	pH Units	8.0	7.9	7.9	7.3
Phosphorus reactive (as P)	0.01	mg/L	0.05	0.07	0.04	0.08
Sulphate (as SO4)	5	mg/L	2300	2500	58	40
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	12000	15000	1200	1400
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	11	7.4	< 5	< 5
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	480	470	380	330
Carbonate Alkalinity (as CaCO3)	10	mg/L	< 10	< 10	< 10	< 10
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	480	470	380	330
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	490	620	94	140
Magnesium	0.5	mg/L	770	900	41	67
Potassium	0.5	mg/L	< 5	< 5	2.4	1.6
Sodium	0.5	mg/L	2600	2800	210	170
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace						
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	0.003	< 0.001	< 0.001	< 0.001
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	0.001	0.001	< 0.001	< 0.001
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C4-PFBA (surr.)	1	%	54	119	129	128
13C5-PFPeA (surr.)	1	%	56	113	111	109
13C5-PFHxA (surr.)	1	%	63	61	106	115

Client Sample ID			SD01_2510	SD02_2510	SD03_2710	SD04_2910
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			B22-No0014932	B22-No0014933	B22-No0014934	B22-No0014935
Date Sampled			Oct 25, 2022	Oct 25, 2022	Oct 27, 2022	Oct 29, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace						
13C4-PFHpA (surr.)	1	%	108	101	82	83
13C8-PFOA (surr.)	1	%	90	80	83	74
13C5-PFNA (surr.)	1	%	106	92	125	113
13C6-PFDA (surr.)	1	%	104	93	124	125
13C2-PFUnDA (surr.)	1	%	78	73	111	98
13C2-PFDoDA (surr.)	1	%	53	59	100	94
13C2-PFTeDA (surr.)	1	%	55	79	105	82
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	0.008	0.008	0.002	0.002
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	0.010	0.009	< 0.001	0.002
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	< 0.001	< 0.001	[N09]0.002	[N09]0.003
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	[N09]0.030	[N09]0.021	[N09]0.023	[N09]0.033
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorooctanesulfonic acid (PFOS)[N11]	0.0001	ug/L	0.017	0.0080	0.067	0.0018
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C3-PFBS (surr.)	1	%	126	125	120	118
18O2-PFHxS (surr.)	1	%	80	78	85	82
13C8-PFOS (surr.)	1	%	86	77	100	110
Perfluoroalkyl sulfonamido substances- Ultra Trace						
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
13C8-FOSA (surr.)	1	%	84	84	113	110
D3-N-MeFOSA (surr.)	1	%	57	71	102	93
D5-N-EtFOSA (surr.)	1	%	51	68	79	89
D7-N-MeFOSE (surr.)	1	%	60	66	80	80
D9-N-EtFOSE (surr.)	1	%	52	67	91	80
D5-N-EtFOSAA (surr.)	1	%	65	75	120	103
D3-N-MeFOSAA (surr.)	1	%	77	84	124	117
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C2-4:2 FTSA (surr.)	1	%	87	75	78	73
13C2-6:2 FTSA (surr.)	1	%	113	99	140	127
13C2-8:2 FTSA (surr.)	1	%	70	65	87	87
13C2-10:2 FTSA (surr.)	1	%	65	64	98	72

Client Sample ID			SD01_2510	SD02_2510	SD03_2710	SD04_2910
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			B22-No0014932	B22-No0014933	B22-No0014934	B22-No0014935
Date Sampled			Oct 25, 2022	Oct 25, 2022	Oct 27, 2022	Oct 29, 2022
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	0.001	ug/L	0.047	0.029	0.09	0.0348
Sum of US EPA PFAS (PFOS + PFOA)*	0.001	ug/L	0.018	0.009	0.067	0.0018
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	ug/L	0.048	0.03	0.09	0.0348
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	0.059	0.038	0.092	0.0368
Sum of PFASs (n=30)*	0.005	ug/L	0.069	0.047	0.094	0.0418

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Ammonia (as N)	Melbourne	Nov 09, 2022	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Conductivity (at 25 °C)	Brisbane	Nov 09, 2022	28 Days
- Method: APHA 2510B			
Nitrate (as N)	Melbourne	Nov 09, 2022	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Nitrite (as N)	Melbourne	Nov 09, 2022	2 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
pH (at 25 °C)	Brisbane	Nov 09, 2022	0 Days
- Method: APHA 4500-H+ B. Electrometric Method			
Phosphorus reactive (as P)	Melbourne	Nov 09, 2022	2 Days
- Method: APHA 4500-P			
Total Suspended Solids Dried at 103 °C to 105 °C	Brisbane	Nov 09, 2022	7 Days
- Method: APHA 2540 D			
Eurofins Suite B11C: Na/K/Ca/Mg	Melbourne	Nov 09, 2022	180 Days
- Method: LTM-MET-3010 Alkali Metals by ICP-AES			
Eurofins Suite B11E: Cl/SO4/Alkalinity			
Chloride	Melbourne	Nov 09, 2022	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Sulphate (as SO4)	Melbourne	Nov 09, 2022	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Alkalinity (speciated)	Melbourne	Nov 09, 2022	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Brisbane	Nov 08, 2022	7 Days
- Method: APHA 2540 C			
Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace			
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonamido substances- Ultra Trace	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) Ultra trace			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
PFASs Summations	Brisbane	Nov 08, 2022	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			

eurofins

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Project Name: CALLIDE
Project ID: BC200153.03

Order No.:
Report #: 938582
Phone: 0400 497 512
Fax:

Received: Nov 4, 2022 3:40 PM
Due: Nov 11, 2022
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Nitrate (as N)	Nitrite (as N)	pH (at 25 °C)	Phosphorus reactive (as P)	Total Suspended Solids Dried at 103 °C to 105 °C	Eurofins Suite B11E: Cl/SO4/Alkalinity	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X		X	X		X		X	X	X	X
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X		X		X		X
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	SD01_2510	Oct 25, 2022		Water	B22-No0014932	X	X	X	X	X	X	X	X	X	X	X
2	SD02_2510	Oct 25, 2022		Water	B22-No0014933	X	X	X	X	X	X	X	X	X	X	X
3	SD03_2710	Oct 27, 2022		Water	B22-No0014934	X	X	X	X	X	X	X	X	X	X	X
4	SD04_2910	Oct 29, 2022		Water	B22-No0014935	X	X	X	X	X	X	X	X	X	X	X
Test Counts						4	4	4	4	4	4	4	4	4	4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Chloride	mg/L	< 1			1	Pass	
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Nitrite (as N)	mg/L	< 0.02			0.02	Pass	
Phosphorus reactive (as P)	mg/L	< 0.01			0.01	Pass	
Sulphate (as SO4)	mg/L	< 5			5	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	mg/L	< 5			5	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Carbonate Alkalinity (as CaCO3)	mg/L	< 10			10	Pass	
Hydroxide Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.005			0.005	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.001			0.001	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.001			0.001	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.001			0.001	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.001			0.001	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.001			0.001	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.001			0.001	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.0001			0.0001	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances- Ultra Trace							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.005			0.005	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.005			0.005	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.005			0.005	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.005			0.005	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.005			0.005	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.005			0.005	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Ammonia (as N)	%	109			70-130	Pass	
Chloride	%	104			70-130	Pass	
Nitrate (as N)	%	101			70-130	Pass	
Nitrite (as N)	%	104			70-130	Pass	
Phosphorus reactive (as P)	%	106			70-130	Pass	
Sulphate (as SO4)	%	119			70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	%	72			70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	%	100			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Carbonate Alkalinity (as CaCO3)	%	99			70-130	Pass	
Total Alkalinity (as CaCO3)	%	99			70-130	Pass	
LCS - % Recovery							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	%	105			80-120	Pass	
Magnesium	%	100			80-120	Pass	
Potassium	%	98			80-120	Pass	
Sodium	%	107			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	%	98			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	87			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	99			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	91			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	85			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	109			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	76			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	89			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	98			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	122			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	126			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	%	75			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	85			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	113			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	77			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	80			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	104			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	75			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances- Ultra Trace							
Perfluorooctane sulfonamide (FOSA)	%	81			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	111			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	98			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	127			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	111			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	104			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	111			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	108			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	97			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Nitrate (as N)	M22-No0022154	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1					
Perfluorobutanoic acid (PFBA)	B22-No0001953	NCP	%	98			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0001953	NCP	%	115			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0001953	NCP	%	105			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0001953	NCP	%	97			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0001953	NCP	%	82			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-No0001953	NCP	%	86			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0001953	NCP	%	98			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0001953	NCP	%	107			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0001953	NCP	%	112			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0001953	NCP	%	123			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0001953	NCP	%	114			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-No0001953	NCP	%	79			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0001953	NCP	%	116			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0001953	NCP	%	100			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0001953	NCP	%	88			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0001953	NCP	%	112			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0001953	NCP	%	126			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0001953	NCP	%	107			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0001953	NCP	%	117			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-No0001953	NCP	%	99			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0001953	NCP	%	113			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0001953	NCP	%	111			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0001953	NCP	%	111			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0001953	NCP	%	106			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0001953	NCP	%	113			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0001953	NCP	%	122			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0001953	NCP	%	137			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0001953	NCP	%	123			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0001953	NCP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0001953	NCP	%	93			50-150	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	B22-No0014934	CP	%	123			75-125	Pass	
Magnesium	B22-No0014934	CP	%	107			75-125	Pass	
Potassium	B22-No0014934	CP	%	101			75-125	Pass	
Sodium	B22-No0014934	CP	%	111			75-125	Pass	
Spike - % Recovery									
				Result 1					
Ammonia (as N)	B22-No0014935	CP	%	96			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	R22-No0013890	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Conductivity (at 25 °C)	B22-No0007595	NCP	uS/cm	170	170	<1	30%	Pass	
Nitrate (as N)	R22-No0013890	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Nitrite (as N)	R22-No0013890	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
pH (at 25 °C)	B22-No0017677	NCP	pH Units	6.9	6.9	<1	30%	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	B22-No0015228	NCP	mg/L	1100	1100	1.1	30%	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	B22-No0017673	NCP	mg/L	88	85	3.0	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Potassium	M22-No0021403	NCP	mg/L	13	13	3.7	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0015583	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0015583	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0015583	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0015583	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0015583	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0015583	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0015583	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0015583	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-No0015583	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0015583	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0015583	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0014841	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0014841	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0014841	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0014841	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0014841	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0014841	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0014841	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0014841	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0015583	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0015583	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0015583	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0015583	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0015583	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0015583	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0015583	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0014841	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0014841	NCP	ug/L	55	51	6.9	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0014841	NCP	ug/L	0.27	0.24	14	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0014841	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	B22-No0014935	CP	mg/L	470	480	<1	30%	Pass	
Sulphate (as SO4)	B22-No0014935	CP	mg/L	40	39	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Inorganic
Jonathon Angell	Senior Analyst-Inorganic
Jonathon Angell	Senior Analyst-PFAS
Mary Makarios	Senior Analyst-Inorganic
Scott Beddoes	Senior Analyst-Inorganic
Scott Beddoes	Senior Analyst-Metal



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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epic ENVIRONMENTAL

PLEASE FORWARD TO EUROFINS

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au)
Phone:	0447 300 420
Page:	1 OF 1
Number of Eskies:	1

Lab:	Eurofins
Lab Quote No:	
Lab Batch No:	
Date Results Required:	
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other PFAS Soil	pH	EC	TDS - Standard	Suspended Solids	Ammonia, Nitrate and Nitrite	Reactive P	Major Cations/Anions	PFAS Ultra Low Level		PFAS in soil (28 Analyte)								HOLD
	SD05_0211	11/02/2022	Water	x	x	x	x		x	x	x	x	x	x	x	x										
	SD06_0211	11/02/2022	Water	x	x	x	x		x	x	x	x	x	x	x	x										
				2	2	2	2		2	2	2	2	2	2	2	2										

Analysis Required

Relinquished By:
Emily ~~Maddison~~ Daniel Paprzak Daniel Paprzak
04~~02 644 333~~ 0439115598 04-Nov-22

Received By
SIGNATURE DATE

Custody Seals Intact Y N
Samples Received Chilled Y N
Method of Shipment

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

939416

Date/Time: 9/11/22 2:35pm
Chilled: Yes No
Temp: 6.9
Correction: -0.2
Final Temp: 6.7

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

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Rolleston,
Christchurch 7675
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IANZ# 1290

Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Luke Amies
Project name:	CALLIDE
Project ID:	BC200153.03
Turnaround time:	5 Day
Date/Time received	Nov 9, 2022 2:35 PM
Eurofins reference	939416

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Luke Amies - lamies@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

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web: www.eurofins.com.au
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Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Project Name: CALLIDE
Project ID: BC200153.03

Order No.:
Report #: 939416
Phone: 0400 497 512
Fax:

Received: Nov 9, 2022 2:35 PM
Due: Nov 16, 2022
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Nitrate (as N)	Nitrite (as N)	pH (at 25 °C)	Phosphorus reactive (as P)	Total Suspended Solids Dried at 103 °C to 105 °C	Eurofins Suite B11E: Cl/SO4/Alkalinity	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X		X	X		X		X		X	
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X		X		X		X
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	SD05_0211	Nov 02, 2022		Water	B22-No0021336	X	X	X	X	X	X	X	X	X	X	X
2	SD06_0211	Nov 02, 2022		Water	B22-No0021337	X	X	X	X	X	X	X	X	X	X	X
Test Counts						2	2	2	2	2	2	2	2	2	2	2

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Luke Amies**

Report **939416-W**
Project name CALLIDE
Project ID BC200153.03
Received Date Nov 09, 2022

Client Sample ID			**SD05_0211**	**SD06_0211**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**B22-No0021336**	**B22-No0021337**
Date Sampled			**Nov 02, 2022**	**Nov 02, 2022**
Test/Reference	LOR	Unit		
Ammonia (as N)	0.01	mg/L	< 0.01	0.13
Chloride	1	mg/L	2700	4400
Conductivity (at 25 °C)	10	uS/cm	8500	10000
Nitrate (as N)	0.02	mg/L	< 0.02	< 0.02
Nitrite (as N)	0.02	mg/L	< 0.02	< 0.02
pH (at 25 °C)	0.1	pH Units	8.0	7.0
Phosphorus reactive (as P)	0.01	mg/L	0.08	0.09
Sulphate (as SO4)	5	mg/L	630	1600
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	6900	6400
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	< 5	15
Alkalinity (speciated)				
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	790	680
Carbonate Alkalinity (as CaCO3)	10	mg/L	< 10	< 10
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	790	680
Eurofins Suite B11C: Na/K/Ca/Mg				
Calcium	0.5	mg/L	210	430
Magnesium	0.5	mg/L	400	700
Potassium	0.5	mg/L	1.3	3.4
Sodium	0.5	mg/L	1400	1900
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	< 0.005	< 0.005
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	< 0.001	< 0.001
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	< 0.001	< 0.001
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	< 0.001	< 0.001
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	< 0.001	< 0.001
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	< 0.001	< 0.001
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	< 0.001	< 0.001
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	< 0.001	< 0.001
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	< 0.001	< 0.001
13C4-PFBA (surr.)	1	%	125	57
13C5-PFPeA (surr.)	1	%	114	68
13C5-PFHxA (surr.)	1	%	50	73

Client Sample ID			SD05_0211	SD06_0211
Sample Matrix			Water	Water
Eurofins Sample No.			B22-No0021336	B22-No0021337
Date Sampled			Nov 02, 2022	Nov 02, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				
13C4-PFHpA (surr.)	1	%	79	124
13C8-PFOA (surr.)	1	%	65	101
13C5-PFNA (surr.)	1	%	69	67
13C6-PFDA (surr.)	1	%	51	75
13C2-PFUnDA (surr.)	1	%	47	71
13C2-PFDoDA (surr.)	1	%	25	46
13C2-PFTeDA (surr.)	1	%	53	76
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	0.039	0.004
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	< 0.001	< 0.001
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	0.045	0.005
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	[N09]0.031	[N09]0.002
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	[N09]0.22	0.006
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	[N09]0.014	< 0.001
Perfluorooctanesulfonic acid (PFOS)[N11]	0.0001	ug/L	0.56	0.0011
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	< 0.001	< 0.001
13C3-PFBS (surr.)	1	%	74	59
18O2-PFHxS (surr.)	1	%	139	59
13C8-PFOS (surr.)	1	%	62	63
Perfluoroalkyl sulfonamido substances- Ultra Trace				
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	< 0.005	< 0.005
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005
13C8-FOSA (surr.)	1	%	38	127
D3-N-MeFOSA (surr.)	1	%	40	87
D5-N-EtFOSA (surr.)	1	%	35	71
D7-N-MeFOSE (surr.)	1	%	27	75
D9-N-EtFOSE (surr.)	1	%	33	73
D5-N-EtFOSAA (surr.)	1	%	25	32
D3-N-MeFOSAA (surr.)	1	%	33	46
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	< 0.005	< 0.005
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001
13C2-4:2 FTSA (surr.)	1	%	40	121
13C2-6:2 FTSA (surr.)	1	%	38	106
13C2-8:2 FTSA (surr.)	1	%	28	95
13C2-10:2 FTSA (surr.)	1	%	49	65

Client Sample ID			SD05_0211	SD06_0211
Sample Matrix			Water	Water
Eurofins Sample No.			B22-No0021336	B22-No0021337
Date Sampled			Nov 02, 2022	Nov 02, 2022
Test/Reference	LOR	Unit		
PFASs Summations				
Sum (PFHxS + PFOS)*	0.001	ug/L	0.78	0.0071
Sum of US EPA PFAS (PFOS + PFOA)*	0.001	ug/L	0.56	0.0011
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	ug/L	0.78	0.0071
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	0.819	0.0111
Sum of PFASs (n=30)*	0.005	ug/L	0.909	0.0181

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Ammonia (as N)	Melbourne	Nov 11, 2022	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Conductivity (at 25 °C)	Brisbane	Nov 16, 2022	28 Days
- Method: APHA 2510B			
Nitrate (as N)	Melbourne	Nov 11, 2022	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
Nitrite (as N)	Melbourne	Nov 11, 2022	2 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
pH (at 25 °C)	Brisbane	Nov 16, 2022	0 Days
- Method: APHA 4500-H+ B. Electrometric Method			
Phosphorus reactive (as P)	Melbourne	Nov 11, 2022	2 Days
- Method: APHA 4500-P			
Total Suspended Solids Dried at 103 °C to 105 °C	Brisbane	Nov 15, 2022	7 Days
- Method: APHA 2540 D			
Eurofins Suite B11C: Na/K/Ca/Mg	Melbourne	Nov 11, 2022	180 Days
- Method: LTM-MET-3010 Alkali Metals by ICP-AES			
Eurofins Suite B11E: Cl/SO4/Alkalinity			
Chloride	Melbourne	Nov 11, 2022	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Sulphate (as SO4)	Melbourne	Nov 11, 2022	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Alkalinity (speciated)	Melbourne	Nov 11, 2022	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Brisbane	Nov 15, 2022	7 Days
- Method: APHA 2540 C			
Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace			
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace	Brisbane	Nov 17, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace	Brisbane	Nov 17, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonamido substances- Ultra Trace	Brisbane	Nov 17, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) Ultra trace			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace	Brisbane	Nov 17, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
PFASs Summations	Brisbane	Nov 14, 2022	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			

eurofins

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QLD 4000

Project Name: CALLIDE
Project ID: BC200153.03

Order No.:
Report #: 939416
Phone: 0400 497 512
Fax:

Received: Nov 9, 2022 2:35 PM
Due: Nov 16, 2022
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Nitrate (as N)	Nitrite (as N)	pH (at 25 °C)	Phosphorus reactive (as P)	Total Suspended Solids Dried at 103 °C to 105 °C	Eurofins Suite B11E: Cl/SO4/Alkalinity	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X		X	X		X		X		X	
Brisbane Laboratory - NATA # 1261 Site # 20794							X			X		X		X		X
External Laboratory																
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**											
1	SD05_0211	Nov 02, 2022		Water	B22-No0021336	X	X	X	X	X	X	X	X	X	X	X
2	SD06_0211	Nov 02, 2022		Water	B22-No0021337	X	X	X	X	X	X	X	X	X	X	X
Test Counts						2	2	2	2	2	2	2	2	2	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/L	< 1			1	Pass	
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Nitrite (as N)	mg/L	< 0.02			0.02	Pass	
Phosphorus reactive (as P)	mg/L	< 0.01			0.01	Pass	
Sulphate (as SO4)	mg/L	< 5			5	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	mg/L	< 5			5	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Carbonate Alkalinity (as CaCO3)	mg/L	< 10			10	Pass	
Hydroxide Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.005			0.005	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.001			0.001	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.001			0.001	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.001			0.001	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.001			0.001	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.001			0.001	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.001			0.001	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.0001			0.0001	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances- Ultra Trace							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.005			0.005	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.005			0.005	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.005			0.005	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.005			0.005	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.005			0.005	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.005			0.005	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Ammonia (as N)	%	127			70-130	Pass	
Chloride	%	92			70-130	Pass	
Nitrate (as N)	%	96			70-130	Pass	
Nitrite (as N)	%	105			70-130	Pass	
Sulphate (as SO4)	%	98			70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	%	112			70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	%	102			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Carbonate Alkalinity (as CaCO3)	%	85			70-130	Pass	
Total Alkalinity (as CaCO3)	%	88			70-130	Pass	
LCS - % Recovery							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	%	83			80-120	Pass	
Magnesium	%	96			80-120	Pass	
Potassium	%	94			80-120	Pass	
Sodium	%	95			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	%	100			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	99			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	104			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	81			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	84			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	104			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	91			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	101			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	111			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	125			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	132			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	%	86			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	118			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	126			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	86			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	101			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	121			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	99			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	77			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances- Ultra Trace							
Perfluorooctane sulfonamide (FOSA)	%	71			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	89			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	90			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	97			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)			%	121			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)			%	101			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)			%	120			50-150	Pass	
LCS - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)			%	129			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)			%	135			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)			%	113			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)			%	112			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
				Result 1					
Ammonia (as N)	M22-No0025399	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	M22-No0029932	NCP	%	98			75-125	Pass	
Magnesium	B22-No0021336	CP	%	90			75-125	Pass	
Potassium	M22-No0029932	NCP	%	110			75-125	Pass	
Sodium	M22-No0026655	NCP	%	80			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1					
Perfluorobutanoic acid (PFBA)	B22-No0043422	NCP	%	82			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0043422	NCP	%	119			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0043422	NCP	%	78			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0043422	NCP	%	108			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0043422	NCP	%	81			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-No0043422	NCP	%	84			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0043422	NCP	%	103			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0043422	NCP	%	102			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0043422	NCP	%	134			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0043422	NCP	%	130			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0043422	NCP	%	113			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-No0043422	NCP	%	105			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0043422	NCP	%	113			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0043422	NCP	%	60			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0043422	NCP	%	114			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0043422	NCP	%	127			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0043422	NCP	%	117			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0043422	NCP	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0043422	NCP	%	83			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-No0043422	NCP	%	67			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0043422	NCP	%	99			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0043422	NCP	%	65			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0043422	NCP	%	105			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0043422	NCP	%	127			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0043422	NCP	%	120			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0043422	NCP	%	140			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0043422	NCP	%	121			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0043422	NCP	%	126			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0043422	NCP	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0043422	NCP	%	75			50-150	Pass	
Spike - % Recovery									
Alkalinity (speciated)				Result 1					
Carbonate Alkalinity (as CaCO3)	M22-No0025397	NCP	%	109			70-130	Pass	
Total Alkalinity (as CaCO3)	M22-No0025397	NCP	%	117			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M22-No0025396	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Chloride	B22-No0021695	NCP	mg/L	800	790	2.1	30%	Pass	
Conductivity (at 25 °C)	B22-No0035164	NCP	uS/cm	800	800	<1	30%	Pass	
Nitrate (as N)	M22-No0025396	NCP	mg/L	0.09	0.10	13	30%	Pass	
Nitrite (as N)	M22-No0025396	NCP	mg/L	0.03	< 0.02	n/a	30%	Pass	
pH (at 25 °C)	B22-No0030562	NCP	pH Units	7.8	7.8	<1	30%	Pass	
Sulphate (as SO4)	B22-No0021695	NCP	mg/L	120	110	3.0	30%	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	B22-No0021336	CP	mg/L	6900	7100	2.8	30%	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	B22-No0021336	CP	mg/L	< 5	< 5	<1	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	B22-No0021336	CP	mg/L	210	230	5.7	30%	Pass	
Magnesium	B22-No0021336	CP	mg/L	400	430	6.9	30%	Pass	
Potassium	B22-No0021336	CP	mg/L	1.3	1.4	9.3	30%	Pass	
Sodium	B22-No0021336	CP	mg/L	1400	1500	5.6	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0043423	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0043423	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0043578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0043578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0043578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0043578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1	Result 2	RPD			
Perfluorodecanoic acid (PFDA)	B22-No0043423	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0043578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0043578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0043578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0043578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0043423	NCP	ug/L	0.005	0.005	5.1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0043423	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0043423	NCP	ug/L	0.004	0.003	6.3	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0043423	NCP	ug/L	0.003	0.003	16	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0043423	NCP	ug/L	0.016	0.016	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0043423	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0043423	NCP	ug/L	0.0056	0.0062	9.8	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0043423	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0043578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0043578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0043578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0043578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0043578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0043578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0043578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0043423	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0043423	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0043423	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0043423	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Bicarbonate Alkalinity (as CaCO3)	M22-No0029489	NCP	mg/L	88	< 20	<1	30%	Pass	
Carbonate Alkalinity (as CaCO3)	M22-No0029489	NCP	mg/L	< 10	< 10	<1	30%	Pass	
Hydroxide Alkalinity (as CaCO3)	M22-No0029489	NCP	mg/L	< 20	< 20	<1	30%	Pass	
Total Alkalinity (as CaCO3)	M22-No0029489	NCP	mg/L	88	< 20	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-Inorganic
Jonathon Angell	Senior Analyst-PFAS
Mary Makarios	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Metal
Scott Beddoes	Senior Analyst-Inorganic



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2306934-AA**	Page	: 1 of 49
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023 11:15
Order number	: ----	Date Analysis Commenced	: 10-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023 15:18
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUARTERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 56		
No. of samples analysed	: 56		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- EP231X-SUT PFAS Super Ultra Trace: Particular samples required dilution due to the presence of high level contaminants and matrix interferences. LOR values have been adjusted accordingly. The LOR values of particular anaytes have been raised for particular samples due to matrix interferences.
- EP231X-SUT PFAS Super Ultra Trace: Ssamples 'DRD' and 'SW43' required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X PFAS-SUT PFAS Super Ultra Trace: High Laboratory Control Spike recoveries for MeFOSA, EtFOSA, MeFOSE and 4:2 FTS are deemed acceptable as associated sample analyte results are less than the limit of reporting.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	PW2	Notch-V1	SW13	Notch-V2	SW20
			Sampling date / time	27-Feb-2023 00:00	27-Feb-2023 00:00	27-Feb-2023 00:00	27-Feb-2023 00:00	28-Feb-2023 00:00
Compound	CAS Number	LOR	Unit	EB2306934-001	EB2306934-002	EB2306934-003	EB2306934-004	EB2306934-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.04	7.97	8.01	8.23	8.42
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	10400	18900	12600	17700	405
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	8950	16400	9070	14200	232
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	11	<1	22	6	34
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	5
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	80	388	633	370	115
Total Alkalinity as CaCO3	----	1	mg/L	80	388	633	370	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2060	2430	792	2210	5
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2620	5580	3790	5120	48
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	637	585	224	404	25
Magnesium	7439-95-4	1	mg/L	435	958	500	798	15
Sodium	7440-23-5	1	mg/L	1170	2610	1800	2660	34
Potassium	7440-09-7	1	mg/L	39	4	2	4	4
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.071	0.066	0.269	0.138	0.118
Iron	7439-89-6	0.05	mg/L	0.10	<0.05	0.65	0.10	0.20
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.3	0.3	0.5	0.2	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.06	0.03	0.05	0.03
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.02	0.04	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	PW2	Notch-V1	SW13	Notch-V2	SW20
				Sampling date / time	27-Feb-2023 00:00	27-Feb-2023 00:00	27-Feb-2023 00:00	27-Feb-2023 00:00	28-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-001	EB2306934-002	EB2306934-003	EB2306934-004	EB2306934-005
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.02**	**0.04**	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.01**	<0.01	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**118**	**216**	**136**	**198**	**3.86**
ø Total Cations	----	0.01	meq/L		**119**	**222**	**131**	**202**	**4.06**
ø Ionic Balance	----	0.01	%		**0.46**	**1.35**	**2.01**	**0.95**	**2.62**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0181**	**0.0121**	**0.0592**	**0.0157**	<0.0008
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0073**	**0.0051**	**0.0426**	**0.0063**	<0.0008
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0513**	**0.0262**	**0.274**	**0.0392**	<0.0010
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0016**	<0.0005	**0.0136**	**0.0008**	<0.0008
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0656**	**0.0142**	**0.281**	**0.0183**	<0.0008
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0160	<0.0039	**0.0080**	<0.0039	<0.0200
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0060	<0.0008	<0.0016	<0.0008	<0.0040
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0070	<0.0008	<0.0016	<0.0008	<0.0008
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0090	**0.0025**	<0.0016	<0.0008	<0.0008
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0025	<0.0008	<0.0016	<0.0005	<0.0008
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		**0.0027**	<0.0008	<0.0016	<0.0005	<0.0008
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0008	<0.0008
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0008	<0.0005	<0.0016	<0.0008	<0.0008
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0008	<0.0005	<0.0016	<0.0008	<0.0008

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	PW2	Notch-V1	SW13	Notch-V2	SW20
				Sampling date / time	27-Feb-2023 00:00	27-Feb-2023 00:00	27-Feb-2023 00:00	27-Feb-2023 00:00	28-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-001	EB2306934-002	EB2306934-003	EB2306934-004	EB2306934-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0020	<0.0019	<0.0040	<0.0020	<0.0100
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0008	<0.0008	<0.0016	<0.0008	<0.0008
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.002	<0.002	<0.004	<0.002	<0.010
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.002	<0.002	<0.004	<0.002	<0.010
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.002	<0.002	<0.004	<0.002	<0.010
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.002	<0.002	<0.004	<0.002	<0.010
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0008	<0.0005	<0.0016	<0.0008	<0.0008
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0008	<0.0005	<0.0016	<0.0008	<0.0008
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	**0.010**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.117**	**0.0404**	**0.555**	**0.0575**	<0.0008
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.135**	**0.0550**	**0.622**	**0.0732**	**0.0100**
^ Sum of PFAS	----	0.0002	µg/L		**0.147**	**0.0601**	**0.678**	**0.0803**	**0.0100**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**128**	**97.1**	**91.1**	**104**	**121**
13C8-PFOA	----	0.0005	%		**107**	**96.8**	**93.3**	**92.1**	**107**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	PW2	Notch-V1	SW13	Notch-V2	SW20
				Sampling date / time	27-Feb-2023 00:00	27-Feb-2023 00:00	27-Feb-2023 00:00	27-Feb-2023 00:00	28-Feb-2023 00:00
Compound	*CAS Number*	*LOR*	*Unit*		**EB2306934-001**	**EB2306934-002**	**EB2306934-003**	**EB2306934-004**	**EB2306934-005**
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SW36	SW12	SW2	DRD	PW1
			Sampling date / time	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00
Compound	CAS Number	LOR	Unit	EB2306934-006	EB2306934-007	EB2306934-008	EB2306934-009	EB2306934-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.31	8.24	8.19	7.76	8.06
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	408	4730	2870	12500	10600
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	237	3280	2030	11100	9250
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	26	12	46	30	4
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	116	276	160	86	71
Total Alkalinity as CaCO3	----	1	mg/L	116	276	160	86	71
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	5	579	245	2590	2060
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	49	1090	732	3200	2700
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	25	172	84	1110	670
Magnesium	7439-95-4	1	mg/L	14	210	114	375	458
Sodium	7440-23-5	1	mg/L	34	534	312	1450	1240
Potassium	7440-09-7	1	mg/L	4	7	10	65	41
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.107	1.11	0.587	1.15	0.061
Iron	7439-89-6	0.05	mg/L	0.57	0.25	0.57	0.29	0.13
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.2	0.9	1.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.03	0.04	0.07	0.03
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW36	SW12	SW2	DRD	PW1
				Sampling date / time	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-006	EB2306934-007	EB2306934-008	EB2306934-009	EB2306934-010
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.04**	<0.01	<0.01	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**3.80**	**48.3**	**28.9**	**146**	**120**
ø Total Cations	----	0.01	meq/L		**3.98**	**49.3**	**27.4**	**151**	**126**
ø Ionic Balance	----	0.01	%		**2.27**	**0.98**	**2.74**	**1.71**	**2.29**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0008	**0.0162**	**0.0072**	**0.0176**	**0.0187**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0008	**0.0113**	**0.0043**	**0.0108**	**0.0082**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0008	**0.0615**	**0.0225**	**0.0594**	**0.0434**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0008	<0.0008	<0.0005	<0.0016	**0.0009**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0008	**0.0106**	**0.0059**	**0.0318**	**0.0251**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0008	<0.0008	<0.0005	<0.0016	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0040	<0.0200	<0.0080	<0.0399	**0.0225**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0008	<0.0040	<0.0016	<0.0080	**0.0138**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0008	<0.0008	<0.0016	**0.0094**	**0.0058**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0008	<0.0008	<0.0016	<0.0080	**0.0135**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0008	<0.0008	<0.0005	**0.0040**	**0.0018**
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0008	<0.0008	<0.0005	**0.0019**	<0.0008
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0008	<0.0008	<0.0005	<0.0016	<0.0008
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0008	<0.0008	<0.0005	<0.0016	<0.0008
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0008	**0.0011**	<0.0016	<0.0080	<0.0008
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0008	<0.0008	<0.0016	<0.0080	<0.0008

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW36	SW12	SW2	DRD	PW1
				Sampling date / time	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-006	EB2306934-007	EB2306934-008	EB2306934-009	EB2306934-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0020	<0.0100	<0.0040	<0.0200	<0.0020
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0008	<0.0008	<0.0016	<0.0016	<0.0008
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.002	<0.002	<0.004	<0.020	<0.002
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.002	<0.002	<0.004	<0.020	<0.002
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.002	<0.002	<0.004	<0.004	<0.002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.002	<0.002	<0.004	<0.004	<0.002
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0008	<0.0008	<0.0016	<0.0080	<0.0008
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0008	<0.0008	<0.0016	<0.0080	<0.0008
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0008	**0.0721**	**0.0284**	**0.0912**	**0.0685**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0008	**0.0883**	**0.0356**	**0.122**	**0.145**
^ Sum of PFAS	----	0.0002	µg/L		<0.0008	**0.101**	**0.0399**	**0.135**	**0.154**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**112**	**101**	**105**	**96.6**	**105**
13C8-PFOA	----	0.0005	%		**94.3**	**92.2**	**104**	**100**	**101**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW36	SW12	SW2	DRD	PW1
				Sampling date / time	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00	28-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-006	EB2306934-007	EB2306934-008	EB2306934-009	EB2306934-010
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SW43	RN13030692	RN13030698	MW77	MW40
			Sampling date / time	28-Feb-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	EB2306934-011	EB2306934-012	EB2306934-013	EB2306934-014	EB2306934-015
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.50	7.90	7.88	7.84	7.85
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	100	520	2330	13900	8750
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	96	307	1800	11700	7110
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	77	<1	<1	2	85
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	35	130	268	560	630
Total Alkalinity as CaCO3	----	1	mg/L	35	130	268	560	630
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	15	40	1410	638
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	5	69	566	4120	2400
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	6	31	157	454	208
Magnesium	7439-95-4	1	mg/L	3	15	82	715	515
Sodium	7440-23-5	1	mg/L	7	46	160	1720	912
Potassium	7440-09-7	1	mg/L	3	1	2	5	1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.117	<0.001	0.002	0.670	0.587
Iron	7439-89-6	0.05	mg/L	1.93	<0.05	<0.05	<0.05	1.53
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.3	0.1	0.1	0.3	0.4
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	<0.01	<0.01	0.14	0.03
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.12	11.7	<0.01	0.05
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW43	RN13030692	RN13030698	MW77	MW40
				Sampling date / time	28-Feb-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-011	EB2306934-012	EB2306934-013	EB2306934-014	EB2306934-015
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.12**	**11.7**	<0.01	**0.06**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.02**	**0.03**	**0.02**	**0.02**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.90**	**4.86**	**22.2**	**157**	**93.6**
ø Total Cations	----	0.01	meq/L		**0.93**	**4.81**	**21.6**	**156**	**92.5**
ø Ionic Balance	----	0.01	%		**----**	**0.50**	**1.28**	**0.10**	**0.60**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0051**	**0.0005**	**0.0045**	**0.0052**	**0.0808**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0032	**0.0006**	**0.0042**	**0.0019**	**0.0335**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0051**	**0.0062**	**0.0363**	**0.0081**	**0.214**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0032	<0.0005	**0.0005**	<0.0005	**0.0160**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0054**	**0.0199**	**0.0049**	**0.0024**	**0.384**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0032	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.0169**	<0.0020	<0.0040	<0.0039	**0.0073**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0032	<0.0005	<0.0008	<0.0008	**0.0020**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0035**	<0.0005	<0.0005	<0.0008	**0.0017**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0038**	<0.0005	<0.0005	<0.0008	**0.0081**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0035**	<0.0005	<0.0005	<0.0008	**0.0005**
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0032	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0032	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0032	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0032	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0032	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW43	RN13030692	RN13030698	MW77	MW40
				Sampling date / time	28-Feb-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-011	EB2306934-012	EB2306934-013	EB2306934-014	EB2306934-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0080	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0032	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.008	<0.002	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.008	<0.002	<0.001	<0.002	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.008	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.008	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0032	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0032	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.003	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.003	<0.001	<0.001	<0.001	**0.282**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.003	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.003	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0105**	**0.0261**	**0.0412**	**0.0105**	**0.598**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0433**	**0.0266**	**0.0457**	**0.0157**	**0.980**
^ Sum of PFAS	----	0.0002	µg/L		**0.0433**	**0.0272**	**0.0504**	**0.0176**	**1.03**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**104**	**109**	**106**	**108**	**98.6**
13C8-PFOA	----	0.0005	%		**101**	**101**	**98.9**	**103**	**94.2**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW43	RN13030692	RN13030698	MW77	MW40
				Sampling date / time	28-Feb-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00	01-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-011	EB2306934-012	EB2306934-013	EB2306934-014	EB2306934-015
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW1	MW74	ESC3	MW11	MW72
			Sampling date / time	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	EB2306934-016	EB2306934-017	EB2306934-018	EB2306934-019	EB2306934-020
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.59	8.08	7.90	7.87	7.98
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	23800	3490	9420	9630	908
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	20700	2220	7810	8460	567
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	7	23	<1	3	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	629	811	228	227	178
Total Alkalinity as CaCO3	----	1	mg/L	629	811	228	227	178
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	551	397	1580	1740	47
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	8030	489	2330	2370	158
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	513	74	409	564	66
Magnesium	7439-95-4	1	mg/L	1130	97	494	545	34
Sodium	7440-23-5	1	mg/L	4320	562	1070	973	67
Potassium	7440-09-7	1	mg/L	28	10	4	<1	6
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	2.67	0.059	7.43	2.00	0.995
Iron	7439-89-6	0.05	mg/L	1.20	1.27	<0.05	2.62	0.79
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.8	1.0	0.5	0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.11	0.03	0.18	0.03	0.03
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW1	MW74	ESC3	MW11	MW72
				Sampling date / time	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-016	EB2306934-017	EB2306934-018	EB2306934-019	EB2306934-020
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.01**	<0.01	**0.01**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**250**	**38.3**	**103**	**108**	**8.99**
ø Total Cations	----	0.01	meq/L		**307**	**36.4**	**108**	**115**	**9.16**
ø Ionic Balance	----	0.01	%		**10.2**	**2.53**	**2.15**	**3.46**	**0.92**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	**0.217**	**0.0140**	**0.0183**	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	**0.150**	<0.0065	**0.0076**	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	**0.364**	**0.0420**	**0.0493**	**0.0018**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	**0.0032**	<0.0016	<0.0016	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	**0.0199**	**0.0273**	**0.0260**	**0.0047**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0016	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	**0.954**	<0.0078	<0.0399	<0.0079
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	**2.24**	<0.0016	<0.0080	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	**0.175**	<0.0016	<0.0016	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0018**	**0.926**	<0.0016	<0.0016	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	**0.0175**	<0.0016	<0.0016	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0016	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0016	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0016	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0016	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0016	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW1	MW74	ESC3	MW11	MW72
				Sampling date / time	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-016	EB2306934-017	EB2306934-018	EB2306934-019	EB2306934-020
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0040	<0.0039	<0.0040	<0.0040
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0016	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.020	<0.004	<0.020	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.004	<0.004	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.004	<0.004	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.004	<0.004	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0016	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0016	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.002	<0.002	<0.002	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.001**	**0.002**	<0.002	<0.002	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.002	<0.002	<0.002	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.002	<0.002	<0.002	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	**0.384**	**0.0693**	**0.0753**	**0.0065**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0028**	**4.92**	**0.0833**	**0.0936**	**0.0065**
^ Sum of PFAS	----	0.0002	µg/L		**0.0028**	**5.07**	**0.0833**	**0.101**	**0.0065**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**116**	**98.9**	**94.2**	**101**	**109**
13C8-PFOA	----	0.0005	%		**107**	**100**	**101**	**98.7**	**94.3**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	MW1	MW74	ESC3	MW11	MW72
				Sampling date / time	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00
Compound	*CAS Number*	*LOR*	*Unit*		**EB2306934-016**	**EB2306934-017**	**EB2306934-018**	**EB2306934-019**	**EB2306934-020**
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW73	MW79	MW80	MW43	MW68
			Sampling date / time	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	EB2306934-021	EB2306934-022	EB2306934-023	EB2306934-024	EB2306934-025
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.76	7.72	8.92	7.74	7.90
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	2320	8810	1540	7700	9270
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	2180	9740	287	7760	7120
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	5	7	28	7
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	32	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	186	436	98	457	606
Total Alkalinity as CaCO3	----	1	mg/L	186	436	130	457	606
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	101	162	100	1230	678
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	604	2870	372	1770	2640
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	193	699	66	410	250
Magnesium	7439-95-4	1	mg/L	102	573	53	689	436
Sodium	7440-23-5	1	mg/L	102	328	146	386	1140
Potassium	7440-09-7	1	mg/L	4	4	30	2	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.083	3.71	0.384	0.181	0.297
Iron	7439-89-6	0.05	mg/L	0.07	1.58	1.17	0.81	0.29
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.2	<0.1	0.4	0.4
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.05	0.31	0.03	0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.03	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.88	0.03	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW73	MW79	MW80	MW43	MW68
				Sampling date / time	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-021	EB2306934-022	EB2306934-023	EB2306934-024	EB2306934-025
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.91**	**0.03**	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	<0.01	**0.05**	<0.01	**0.03**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**22.8**	**93.0**	**15.2**	**84.7**	**101**
ø Total Cations	----	0.01	meq/L		**22.6**	**96.4**	**14.8**	**94.0**	**98.0**
ø Ionic Balance	----	0.01	%		**0.64**	**1.78**	**1.33**	**5.23**	**1.36**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0074**	**0.0058**	<0.0030	**0.338**	**0.0490**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0057**	<0.0030	<0.0008	**0.351**	**0.0354**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0331**	**0.0134**	<0.0008	**1.41**	**0.210**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0017**	<0.0008	<0.0008	**0.0286**	**0.0120**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0969**	<0.0020	**0.115**	**0.156**	**0.304**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0008	<0.0008	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0039	<0.0039	**0.149**	<0.0078
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0008	<0.0008	**0.101**	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0008	<0.0008	**0.0319**	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0008	<0.0030	**0.339**	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0008	<0.0008	**0.0341**	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0008	<0.0008	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0008	<0.0008	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0008	<0.0008	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0008	<0.0008	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0008	<0.0008	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW73	MW79	MW80	MW43	MW68
				Sampling date / time	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-021	EB2306934-022	EB2306934-023	EB2306934-024	EB2306934-025
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0197	<0.0020	<0.0008	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0008	<0.0008	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.002	<0.002	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.002	<0.002	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.002	<0.002	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.002	<0.002	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0008	<0.0008	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0008	<0.0008	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	**0.006**	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.130**	**0.0134**	**0.115**	**1.57**	**0.514**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.137**	**0.0252**	**0.115**	**2.56**	**0.563**
^ Sum of PFAS	----	0.0002	µg/L		**0.145**	**0.0252**	**0.115**	**2.94**	**0.610**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**112**	**113**	**109**	**109**	**104**
13C8-PFOA	----	0.0005	%		**92.6**	**96.1**	**95.0**	**96.4**	**95.3**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW73	MW79	MW80	MW43	MW68
				Sampling date / time	02-Mar-2023 00:00	02-Mar-2023 00:00	02-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-021	EB2306934-022	EB2306934-023	EB2306934-024	EB2306934-025
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	ESC4	MW75	MW76	MW78	MW9
			Sampling date / time	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	EB2306934-026	EB2306934-027	EB2306934-028	EB2306934-029	EB2306934-030
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.88	7.86	8.03	8.13	7.93
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	9000	26900	8840	11300	12500
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	8260	30400	7990	7750	9560
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	19	401	6	99
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	201	746	113	570	452
Total Alkalinity as CaCO3	----	1	mg/L	201	746	113	570	452
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1620	720	2140	1470	1720
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2260	9340	1810	2790	3280
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	543	457	808	108	316
Magnesium	7439-95-4	1	mg/L	548	1250	408	343	633
Sodium	7440-23-5	1	mg/L	824	4880	843	1990	1790
Potassium	7440-09-7	1	mg/L	1	13	30	3	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.554	0.472	1.72	0.069	0.390
Iron	7439-89-6	0.05	mg/L	0.22	1.08	15.5	<0.05	1.41
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.6	0.3	8.4	1.1	0.7
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.06	0.35	<0.01	0.03
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.40	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.30	<0.01	<0.01	0.15
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	ESC4	MW75	MW76	MW78	MW9
				Sampling date / time	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-026	EB2306934-027	EB2306934-028	EB2306934-029	EB2306934-030
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.70**	<0.01	<0.01	**0.15**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.11**	**0.01**	**0.03**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**101**	**293**	**97.9**	**121**	**137**
ø Total Cations	----	0.01	meq/L		**108**	**338**	**111**	**120**	**146**
ø Ionic Balance	----	0.01	%		**3.13**	**7.11**	**6.44**	**0.18**	**2.97**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0348**	<0.0040	<0.0016	**0.0182**	**0.0221**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0331**	<0.0005	<0.0016	**0.0095**	**0.0062**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.197**	**0.0049**	<0.0016	**0.0447**	**0.0407**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0066**	<0.0005	<0.0016	<0.0015	<0.0020
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0716**	<0.0014	<0.0016	**0.0426**	**0.0531**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0079	<0.0159	**0.0296**	<0.0077	<0.0395
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0032	<0.0016	<0.0015	<0.0079
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0032	<0.0016	<0.0015	<0.0008
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0032	<0.0016	<0.0015	<0.0008
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0015	<0.0010	<0.0016	<0.0005	<0.0008
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0010	<0.0008
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	ESC4	MW75	MW76	MW78	MW9
				Sampling date / time	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-026	EB2306934-027	EB2306934-028	EB2306934-029	EB2306934-030
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0008	<0.0040	<0.0038	<0.0020
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.002
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.002
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.002
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0008
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.002	**0.020**	**0.002**	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.269**	**0.0049**	<0.0016	**0.0873**	**0.0938**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.303**	**0.0249**	**0.0316**	**0.106**	**0.116**
^ Sum of PFAS	----	0.0002	µg/L		**0.343**	**0.0249**	**0.0316**	**0.115**	**0.122**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**109**	**111**	**109**	**103**	**115**
13C8-PFOA	----	0.0005	%		**94.9**	**95.2**	**96.6**	**95.5**	**96.6**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	ESC4	MW75	MW76	MW78	MW9
				Sampling date / time	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00	03-Mar-2023 00:00
Compound	*CAS Number*	*LOR*	*Unit*		**EB2306934-026**	**EB2306934-027**	**EB2306934-028**	**EB2306934-029**	**EB2306934-030**
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW49	MW31	MW32	MW23	MW66
			Sampling date / time	03-Mar-2023 00:00	04-Mar-2023 00:00	04-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	EB2306934-031	EB2306934-033	EB2306934-034	EB2306934-035	EB2306934-036
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.78	8.29	7.70	7.93	7.94
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	17300	2120	6760	8940	9450
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	15500	1200	6950	8250	8360
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	22	<1	3	1	15
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	2	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	695	507	443	196	168
Total Alkalinity as CaCO3	----	1	mg/L	695	510	443	196	168
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1020	13	889	1630	1770
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	5540	422	1700	2240	2320
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	596	38	490	499	527
Magnesium	7439-95-4	1	mg/L	854	94	513	509	534
Sodium	7440-23-5	1	mg/L	2250	272	255	788	958
Potassium	7440-09-7	1	mg/L	8	<1	<1	1	1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	2.80	0.053	0.899	0.904	4.09
Iron	7439-89-6	0.05	mg/L	2.79	<0.05	0.16	<0.05	0.66
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	1.0	0.6	0.8	1.3
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.08	<0.01	0.03	0.05	0.09
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.18	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW49	MW31	MW32	MW23	MW66
				Sampling date / time	03-Mar-2023 00:00	04-Mar-2023 00:00	04-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-031	EB2306934-033	EB2306934-034	EB2306934-035	EB2306934-036
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.18**	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.03**	<0.01	<0.01	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**191**	**22.4**	**75.3**	**101**	**106**
ø Total Cations	----	0.01	meq/L		**198**	**21.5**	**77.8**	**101**	**112**
ø Ionic Balance	----	0.01	%		**1.72**	**2.05**	**1.60**	**0.03**	**2.89**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.159**	<0.0005	**0.620**	**0.0330**	**0.0120**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.255**	<0.0005	**0.795**	**0.0325**	**0.0066**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**2.70**	<0.0010	**4.99**	**0.222**	**0.0374**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0360**	<0.0005	**0.222**	**0.0072**	<0.0015
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.676**	**0.0007**	**1.25**	**0.0709**	**0.0291**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0008	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0399	<0.0079	**0.201**	<0.0077	<0.0078
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0080	<0.0016	**0.306**	<0.0015	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0050	<0.0005	**0.134**	<0.0015	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0395**	<0.0016	**1.15**	<0.0015	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0045	<0.0005	**0.240**	<0.0015	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0008	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0008	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0008	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0008	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0008	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW49	MW31	MW32	MW23	MW66
				Sampling date / time	03-Mar-2023 00:00	04-Mar-2023 00:00	04-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-031	EB2306934-033	EB2306934-034	EB2306934-035	EB2306934-036
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0020	<0.0040	<0.0194	<0.0039	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0008	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.002	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.002	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.002	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.002	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0008	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0008	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.016**	<0.001	**0.003**	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**3.38**	**0.0007**	**6.24**	**0.293**	**0.0665**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**3.59**	**0.0007**	**8.89**	**0.326**	**0.0785**
^ Sum of PFAS	----	0.0002	µg/L		**3.88**	**0.0007**	**9.91**	**0.366**	**0.0851**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**106**	**118**	**115**	**114**	**114**
13C8-PFOA	----	0.0005	%		**96.6**	**91.7**	**92.5**	**98.8**	**95.6**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW49	MW31	MW32	MW23	MW66
				Sampling date / time	03-Mar-2023 00:00	04-Mar-2023 00:00	04-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-031	EB2306934-033	EB2306934-034	EB2306934-035	EB2306934-036
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	RN13030697	SW41	RN13030126	SW22	MW69
			Sampling date / time	06-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00	07-Mar-2023 00:00	07-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	EB2306934-037	EB2306934-038	EB2306934-039	EB2306934-041	EB2306934-042
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.20	8.19	7.95	8.07	7.99
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1170	689	573	1090	1100
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	960	442	360	780	756
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	----	15	<1	435	2
Suspended Solids (SS)	----	5	mg/L	55200	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	231	176	134	148	180
Total Alkalinity as CaCO3	----	1	mg/L	231	176	134	148	180
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	17	3	12	30	68
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	233	112	86	250	212
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	85	46	38	62	77
Magnesium	7439-95-4	1	mg/L	23	21	18	44	37
Sodium	7440-23-5	1	mg/L	105	59	47	84	92
Potassium	7440-09-7	1	mg/L	11	7	2	8	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	29.3	0.246	0.003	1.94	0.009
Iron	7439-89-6	0.05	mg/L	434	0.21	0.08	1.63	<0.05
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.2	0.1	0.1	<0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.42	0.03	<0.01	0.15	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	0.08	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	1.16	0.02	0.06	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030697	SW41	RN13030126	SW22	MW69
				Sampling date / time	06-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00	07-Mar-2023 00:00	07-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-037	EB2306934-038	EB2306934-039	EB2306934-041	EB2306934-042
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**1.24**	**0.02**	**0.06**	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.02**	**0.08**	**0.02**	<0.01	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**11.5**	**6.74**	**5.35**	**10.6**	**11.0**
ø Total Cations	----	0.01	meq/L		**11.0**	**6.77**	**5.47**	**10.6**	**10.9**
ø Ionic Balance	----	0.01	%		**2.48**	**0.23**	**1.11**	**0.28**	**0.24**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0159	**0.0047**	**0.0007**	<0.0016	**0.0024**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0159	<0.0015	**0.0006**	<0.0016	**0.0017**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.102**	**0.0164**	**0.0050**	**0.0122**	**0.0139**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0159	<0.0010	<0.0005	<0.0016	**0.0006**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0841**	**0.0339**	**0.0071**	**0.0160**	**0.0482**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0159	<0.0005	<0.0005	<0.0016	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0794	<0.0159	<0.0020	<0.0079	<0.0080
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0159	<0.0032	<0.0005	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0159	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0159	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0159	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0159	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0159	<0.0005	<0.0005	<0.0016	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0159	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0159	<0.0005	<0.0016	<0.0016	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0159	<0.0005	<0.0016	<0.0016	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030697	SW41	RN13030126	SW22	MW69
				Sampling date / time	06-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00	07-Mar-2023 00:00	07-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-037	EB2306934-038	EB2306934-039	EB2306934-041	EB2306934-042
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0397	<0.0079	<0.0005	<0.0397	<0.0040
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0159	<0.0005	<0.0016	<0.0016	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.040	<0.008	<0.004	<0.040	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.040	<0.008	<0.004	<0.040	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.040	<0.001	<0.004	<0.040	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.040	<0.001	<0.004	<0.040	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0159	<0.0005	<0.0016	<0.0016	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0159	<0.0005	<0.0016	<0.0016	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.016	<0.001	<0.001	<0.002	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.046**	<0.001	<0.001	<0.002	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.016	<0.001	<0.001	<0.002	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.016	<0.001	<0.001	<0.002	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.186**	**0.0503**	**0.0121**	**0.0282**	**0.0621**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.232**	**0.0550**	**0.0128**	**0.0282**	**0.0645**
^ Sum of PFAS	----	0.0002	µg/L		**0.232**	**0.0550**	**0.0134**	**0.0282**	**0.0668**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**110**	**110**	**109**	**108**	**108**
13C8-PFOA	----	0.0005	%		**95.5**	**90.7**	**93.9**	**98.3**	**91.0**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	RN13030697	SW41	RN13030126	SW22	MW69
			Sampling date / time	06-Mar-2023 00:00	06-Mar-2023 00:00	06-Mar-2023 00:00	07-Mar-2023 00:00	07-Mar-2023 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**EB2306934-037**	**EB2306934-038**	**EB2306934-039**	**EB2306934-041**	**EB2306934-042**
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	RN13030127	RN13030715	MW70	FB01_0103	FB01_0303
			Sampling date / time	07-Mar-2023 00:00	07-Mar-2023 00:00	07-Mar-2023 00:00	01-Mar-2023 00:00	03-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	EB2306934-043	EB2306934-045	EB2306934-046	EB2306934-048	EB2306934-049
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.86	8.15	8.00	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	812	2870	833	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	607	2050	533	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	94	3	<1	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	109	295	172	----	----
Total Alkalinity as CaCO3	----	1	mg/L	109	295	172	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	4	53	41	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	196	738	137	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	41	154	58	----	----
Magnesium	7439-95-4	1	mg/L	33	89	29	----	----
Sodium	7440-23-5	1	mg/L	68	311	69	----	----
Potassium	7440-09-7	1	mg/L	<1	1	2	----	----
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	1.35	0.003	0.204	----	----
Iron	7439-89-6	0.05	mg/L	34.9	0.08	0.09	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	0.2	0.1	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.10	<0.01	0.02	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	3.82	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030127	RN13030715	MW70	FB01_0103	FB01_0303
				Sampling date / time	07-Mar-2023 00:00	07-Mar-2023 00:00	07-Mar-2023 00:00	01-Mar-2023 00:00	03-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-043	EB2306934-045	EB2306934-046	EB2306934-048	EB2306934-049
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**3.82**	<0.01	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.08**	<0.01	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**7.79**	**27.8**	**8.15**	----	----
ø Total Cations	----	0.01	meq/L		**7.72**	**28.6**	**8.33**	----	----
ø Ionic Balance	----	0.01	%		**0.45**	**1.32**	**1.08**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0071**	**0.0016**	**0.0015**	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0058**	**0.0008**	**0.0011**	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0521**	**0.0020**	**0.0111**	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0031	<0.0005	**0.0006**	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0132**	<0.0002	**0.0636**	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0031	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0154	<0.0020	<0.0080	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0031	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0031	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0031	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0031	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0031	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0031	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0031	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0031	<0.0005	<0.0016	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0031	<0.0005	<0.0016	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030127	RN13030715	MW70	FB01_0103	FB01_0303
				Sampling date / time	07-Mar-2023 00:00	07-Mar-2023 00:00	07-Mar-2023 00:00	01-Mar-2023 00:00	03-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-043	EB2306934-045	EB2306934-046	EB2306934-048	EB2306934-049
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0077	<0.0005	<0.0040	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0031	<0.0005	<0.0016	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.077	<0.001	<0.004	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.077	<0.001	<0.004	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.008	<0.001	<0.004	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.008	<0.001	<0.004	<0.001	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0031	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0031	<0.0005	<0.0016	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.003	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.060**	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.003	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.003	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0653**	**0.0020**	**0.0747**	<0.0002	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.132**	**0.0036**	**0.0762**	<0.0002	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		**0.138**	**0.0044**	**0.0779**	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**115**	**115**	**116**	**108**	**118**
13C8-PFOA	----	0.0005	%		**98.2**	**97.4**	**96.6**	**85.2**	**95.8**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	RN13030127	RN13030715	MW70	FB01_0103	FB01_0303
				Sampling date / time	07-Mar-2023 00:00	07-Mar-2023 00:00	07-Mar-2023 00:00	01-Mar-2023 00:00	03-Mar-2023 00:00
Compound	*CAS Number*	*LOR*	*Unit*		**EB2306934-043**	**EB2306934-045**	**EB2306934-046**	**EB2306934-048**	**EB2306934-049**
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB01_0403	FB01_0703	RB01_0203	RB01_0303	RB01_0403
				Sampling date / time	04-Mar-2023 00:00	07-Mar-2023 00:00	02-Mar-2023 00:00	03-Mar-2023 00:00	04-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-050	EB2306934-051	EB2306934-052	EB2306934-053	EB2306934-054
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.004

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB01_0403	FB01_0703	RB01_0203	RB01_0303	RB01_0403
				Sampling date / time	04-Mar-2023 00:00	07-Mar-2023 00:00	02-Mar-2023 00:00	03-Mar-2023 00:00	04-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-050	EB2306934-051	EB2306934-052	EB2306934-053	EB2306934-054
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.001	<0.004	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**116**	**113**	**119**	**119**	**123**
13C8-PFOA	----	0.0005	%		**98.1**	**97.7**	**97.3**	**95.7**	**96.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	RB01_0703	BD01_2902	BD02_0203	BD03_0303	BD04_0703
			Sampling date / time	07-Mar-2023 00:00	01-Mar-2023 00:00	02-Mar-2023 00:00	03-Mar-2023 00:00	07-Mar-2023 00:00
Compound	CAS Number	LOR	Unit	EB2306934-055	EB2306934-056	EB2306934-057	EB2306934-058	EB2306934-059
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	----	7.92	8.06	8.19	8.04
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	2310	908	11300	839
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	----	1860	574	7640	553
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	----	<1	<1	<1	1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	----	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	----	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	----	271	180	572	173
Total Alkalinity as CaCO3	----	1	mg/L	----	271	180	572	173
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	40	48	1470	41
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	----	565	156	2780	137
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	----	162	62	105	58
Magnesium	7439-95-4	1	mg/L	----	80	31	312	30
Sodium	7440-23-5	1	mg/L	----	192	74	2130	71
Potassium	7440-09-7	1	mg/L	----	2	5	1	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	----	<0.001	0.782	0.054	0.213
Iron	7439-89-6	0.05	mg/L	----	<0.05	<0.05	<0.05	0.13
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	----	0.1	0.1	1.0	0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	----	0.01	0.04	<0.01	0.02
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	----	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	----	11.6	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB01_0703	BD01_2902	BD02_0203	BD03_0303	BD04_0703
				Sampling date / time	07-Mar-2023 00:00	01-Mar-2023 00:00	02-Mar-2023 00:00	03-Mar-2023 00:00	07-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-055	EB2306934-056	EB2306934-057	EB2306934-058	EB2306934-059
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		----	**11.6**	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	**0.02**	**0.01**	**0.01**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	**22.2**	**9.00**	**120**	**8.17**
ø Total Cations	----	0.01	meq/L		----	**23.1**	**8.99**	**124**	**8.50**
ø Ionic Balance	----	0.01	%		----	**1.96**	**0.02**	**1.28**	**1.97**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	**0.0033**	<0.0005	**0.0188**	**0.0016**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	**0.0037**	<0.0005	**0.0103**	**0.0013**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	**0.0316**	**0.0015**	**0.0512**	**0.0138**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	**0.0006**	<0.0005	<0.0020	<0.0010
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	**0.0060**	**0.0050**	**0.0387**	**0.0619**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0080	<0.0079	<0.0078	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB01_0703	BD01_2902	BD02_0203	BD03_0303	BD04_0703
				Sampling date / time	07-Mar-2023 00:00	01-Mar-2023 00:00	02-Mar-2023 00:00	03-Mar-2023 00:00	07-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-055	EB2306934-056	EB2306934-057	EB2306934-058	EB2306934-059
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0040	<0.0040	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.004	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.004	<0.004	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	**0.0376**	**0.0065**	**0.0899**	**0.0757**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0002	**0.0409**	**0.0065**	**0.109**	**0.0773**
^ Sum of PFAS	----	0.0002	µg/L		<0.0002	**0.0452**	**0.0065**	**0.119**	**0.0786**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**115**	**115**	**114**	**80.9**	**101**
13C8-PFOA	----	0.0005	%		**97.1**	**97.5**	**97.7**	**94.8**	**82.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB01_0703	BD01_2902	BD02_0203	BD03_0303	BD04_0703
				Sampling date / time	07-Mar-2023 00:00	01-Mar-2023 00:00	02-Mar-2023 00:00	03-Mar-2023 00:00	07-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		EB2306934-055	EB2306934-056	EB2306934-057	EB2306934-058	EB2306934-059
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD04_0803	----	----	----	----
				Sampling date / time	08-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-060	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.94**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**1360**	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**1050**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L		<1	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**160**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**160**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**86**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**303**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**97**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**50**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**102**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**2**	----	----	----	----
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		**0.009**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.1**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.03**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD04_0803	----	----	----	----
				Sampling date / time	08-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-060	--------	--------	--------	--------
					Result	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**13.5**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**13.4**	----	----	----	----
ø Ionic Balance	----	0.01	%		**0.34**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0018**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0018**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0209**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0147**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD04_0803	----	----	----	----
				Sampling date / time	08-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-060	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0356**	----	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0374**	----	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		**0.0392**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**91.9**	----	----	----	----
13C8-PFOA	----	0.0005	%		**83.1**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	**BD04_0803**	**----**	**----**	**----**	**----**
				Sampling date / time	08-Mar-2023 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EB2306934-060**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
EP231S: PFAS Surrogate - Continued									

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2306934-AB**	Page	: 1 of 7
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023 11:15
Order number	: ----	Date Analysis Commenced	: 10-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023 15:21
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUARTERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- EP231X-SUT PFAS Super Ultra Trace: Particular samples required dilution due to the presence of high level contaminants and matrix interferences. LOR values have been adjusted accordingly. The LOR values of particular anaytes have been raised for particular samples due to matrix interferences.
- EP231X-SUT PFAS Super Ultra Trace: Ssamples 'DRD' and 'SW43' required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X PFAS-SUT PFAS Super Ultra Trace: High Laboratory Control Spike recoveries for MeFOSA, EtFOSA, MeFOSE and 4:2 FTS are deemed acceptable as associated sample analyte results are less than the limit of reporting.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L005-B01	----	----	----	----
				Sampling date / time	07-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-044	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		8.28	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		2130	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		1370	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L		<1	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		297	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		297	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		64	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		489	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		113	----	----	----	----
Magnesium	7439-95-4	1	mg/L		59	----	----	----	----
Sodium	7440-23-5	1	mg/L		253	----	----	----	----
Potassium	7440-09-7	1	mg/L		2	----	----	----	----
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		<0.001	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.1	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		2.10	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L005-B01	----	----	----	----
				Sampling date / time	07-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-044	--------	--------	--------	--------
					Result	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**2.10**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**21.1**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**21.6**	----	----	----	----
ø Ionic Balance	----	0.01	%		**1.15**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0028**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0035**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0290**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0013**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0872**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0006**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L005-B01	----	----	----	----
				Sampling date / time	07-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-044	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.116**	----	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.120**	----	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		**0.124**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**110**	----	----	----	----
13C8-PFOA	----	0.0005	%		**97.7**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	**L005-B01**	**----**	**----**	**----**	**----**
				Sampling date / time	07-Mar-2023 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EB2306934-044**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
EP231S: PFAS Surrogate - Continued									

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2306934-AC**	Page	: 1 of 7
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023 11:15
Order number	: ----	Date Analysis Commenced	: 10-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023 15:21
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUARTERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
No. of samples analysed	: 1		

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Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

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Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- EP231X-SUT PFAS Super Ultra Trace: Particular samples required dilution due to the presence of high level contaminants and matrix interferences. LOR values have been adjusted accordingly. The LOR values of particular anaytes have been raised for particular samples due to matrix interferences.
- EP231X-SUT PFAS Super Ultra Trace: Ssamples 'DRD' and 'SW43' required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X PFAS-SUT PFAS Super Ultra Trace: High Laboratory Control Spike recoveries for MeFOSA, EtFOSA, MeFOSE and 4:2 FTS are deemed acceptable as associated sample analyte results are less than the limit of reporting.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L006-B05	----	----	----	----
				Sampling date / time	04-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2306934-032	--------	--------	--------	--------	
				Result	----	----	----	----	
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit	**7.85**	----	----	----	----	
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	**1920**	----	----	----	----	
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L	**1610**	----	----	----	----	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L	<1	----	----	----	----	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**151**	----	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	**151**	----	----	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**83**	----	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	**506**	----	----	----	----	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	**136**	----	----	----	----	
Magnesium	7439-95-4	1	mg/L	**74**	----	----	----	----	
Sodium	7440-23-5	1	mg/L	**107**	----	----	----	----	
Potassium	7440-09-7	1	mg/L	**2**	----	----	----	----	
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L	<0.001	----	----	----	----	
Iron	7439-89-6	0.05	mg/L	<0.05	----	----	----	----	
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L	**0.1**	----	----	----	----	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	----	----	----	----	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	----	----	----	----	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	**1.08**	----	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L006-B05	----	----	----	----
				Sampling date / time	04-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-032	--------	--------	--------	--------
					Result	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**1.08**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**19.0**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**17.6**	----	----	----	----
ø Ionic Balance	----	0.01	%		**3.92**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0035**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0043**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0403**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0014**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0774**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.0022**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L006-B05	----	----	----	----
				Sampling date / time	04-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-032	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.118**	----	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.123**	----	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		**0.129**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**112**	----	----	----	----
13C8-PFOA	----	0.0005	%		**95.7**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	**L006-B05**	**----**	**----**	**----**	**----**
				Sampling date / time	04-Mar-2023 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EB2306934-032**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
EP231S: PFAS Surrogate - Continued									

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2306934-AD**	Page	: 1 of 7
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023 11:15
Order number	: ----	Date Analysis Commenced	: 10-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023 15:21
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUARTERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- EP231X-SUT PFAS Super Ultra Trace: Particular samples required dilution due to the presence of high level contaminants and matrix interferences. LOR values have been adjusted accordingly. The LOR values of particular anaytes have been raised for particular samples due to matrix interferences.
- EP231X-SUT PFAS Super Ultra Trace: Ssamples 'DRD' and 'SW43' required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X PFAS-SUT PFAS Super Ultra Trace: High Laboratory Control Spike recoveries for MeFOSA, EtFOSA, MeFOSE and 4:2 FTS are deemed acceptable as associated sample analyte results are less than the limit of reporting.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L012-B01	----	----	----	----
				Sampling date / time	08-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-047	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.71**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**1360**	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**1020**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L		<1	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**161**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**161**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**87**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**304**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**98**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**51**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**103**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**2**	----	----	----	----
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		**0.008**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.1**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.03**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L012-B01	----	----	----	----
				Sampling date / time	08-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-047	--------	--------	--------	--------
					Result	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**13.6**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**13.6**	----	----	----	----
ø Ionic Balance	----	0.01	%		**0.06**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0018**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0019**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0177**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0006**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0180**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0079	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L012-B01	----	----	----	----
				Sampling date / time	08-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-047	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0039	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0357**	----	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0375**	----	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		**0.0400**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**121**	----	----	----	----
13C8-PFOA	----	0.0005	%		**99.8**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	L012-B01	----	----	----	----
				Sampling date / time	08-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2306934-047	--------	--------	--------	--------	
				Result	----	----	----	----	
EP231S: PFAS Surrogate - Continued									

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2306934-AE**	Page	: 1 of 7
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023 11:15
Order number	: ----	Date Analysis Commenced	: 10-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023 15:21
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUARTERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

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- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

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Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

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LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- EP231X-SUT PFAS Super Ultra Trace: Particular samples required dilution due to the presence of high level contaminants and matrix interferences. LOR values have been adjusted accordingly. The LOR values of particular anaytes have been raised for particular samples due to matrix interferences.
- EP231X-SUT PFAS Super Ultra Trace: Ssamples 'DRD' and 'SW43' required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X PFAS-SUT PFAS Super Ultra Trace: High Laboratory Control Spike recoveries for MeFOSA, EtFOSA, MeFOSE and 4:2 FTS are deemed acceptable as associated sample analyte results are less than the limit of reporting.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L021-B01	----	----	----	----
				Sampling date / time	06-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-040	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**8.02**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**522**	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**293**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L		<1	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**124**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**124**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**8**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**80**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**30**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**15**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**47**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**1**	----	----	----	----
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		<0.001	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.1**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.18**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L021-B01	----	----	----	----
				Sampling date / time	06-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-040	--------	--------	--------	--------
					Result	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.18**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**4.90**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**4.80**	----	----	----	----
ø Ionic Balance	----	0.01	%		**1.02**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0009**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0013**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0122**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0005**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0571**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L021-B01	----	----	----	----
				Sampling date / time	06-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2306934-040	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0693**	----	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0702**	----	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		**0.0720**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**104**	----	----	----	----
13C8-PFOA	----	0.0005	%		**95.8**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	L021-B01	----	----	----	----
				Sampling date / time	06-Mar-2023 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EB2306934-040**	--------	--------	--------	--------
					Result	----	----	----	----
EP231S: PFAS Surrogate - Continued									

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2306934-AA**	Page	: 1 of 25
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023
Order number	: ----	Date Analysis Commenced	: 10-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUARTERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 56		
No. of samples analysed	: 56		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4926501)									
EB2306934-001	PW2	EA005-P: pH Value	----	0.01	pH Unit	8.04	8.11	0.9	0% - 20%
EB2306934-011	SW43	EA005-P: pH Value	----	0.01	pH Unit	7.50	7.50	0.0	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 4926506)									
EB2306934-021	MW73	EA005-P: pH Value	----	0.01	pH Unit	7.76	7.75	0.1	0% - 20%
EB2306934-031	MW49	EA005-P: pH Value	----	0.01	pH Unit	7.78	7.78	0.0	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 4926510)									
EB2306934-041	SW22	EA005-P: pH Value	----	0.01	pH Unit	8.07	8.13	0.7	0% - 20%
EB2306934-059	BD04_0703	EA005-P: pH Value	----	0.01	pH Unit	8.04	8.10	0.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4926500)									
EB2306934-001	PW2	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	10400	10400	0.0	0% - 20%
EB2306934-011	SW43	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	100	98	1.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4926507)									
EB2306934-021	MW73	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2320	2310	0.5	0% - 20%
EB2306934-031	MW49	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	17300	17400	0.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4926511)									
EB2306934-041	SW22	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1090	1090	0.1	0% - 20%
EB2306934-059	BD04_0703	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	839	842	0.4	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4926502)									
EB2306934-001	PW2	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	80	82	2.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	80	82	2.4	0% - 20%
EB2306934-011	SW43	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 4926502) - continued									
EB2306934-011	SW43	ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	35	34	2.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	35	34	2.9	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4926505)									
EB2306934-021	MW73	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	186	187	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	186	187	0.6	0% - 20%
EB2306934-031	MW49	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	695	699	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	695	699	0.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4926509)									
EB2306934-041	SW22	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	148	150	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	148	150	1.3	0% - 20%
EB2306934-059	BD04_0703	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	173	173	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	173	173	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4923026)									
EB2306934-001	PW2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2060	2030	1.4	0% - 20%
EB2306934-011	SW43	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	2	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4923030)									
EB2306934-021	MW73	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	101	101	0.0	0% - 20%
EB2306934-031	MW49	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1020	1020	0.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4923034)									
EB2306934-041	SW22	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	30	30	0.0	0% - 20%
EB2306934-059	BD04_0703	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	41	41	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4923025)									
EB2306934-001	PW2	ED045G: Chloride	16887-00-6	1	mg/L	2620	2620	0.2	0% - 20%
EB2306934-011	SW43	ED045G: Chloride	16887-00-6	1	mg/L	5	5	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 4923027)									
EB2306934-021	MW73	ED045G: Chloride	16887-00-6	1	mg/L	604	618	2.4	0% - 20%
EB2306934-031	MW49	ED045G: Chloride	16887-00-6	1	mg/L	5540	5560	0.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4923031)									
EB2306934-041	SW22	ED045G: Chloride	16887-00-6	1	mg/L	250	250	0.0	0% - 20%
EB2306934-059	BD04_0703	ED045G: Chloride	16887-00-6	1	mg/L	137	138	0.7	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4933808)									
EB2306820-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	34	33	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	28	27	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	94	93	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EB2306842-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	33	37	11.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	16	9.4	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	47	51	7.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 4933809)									
EB2306934-059	BD04_0703	ED093F: Calcium	7440-70-2	1	mg/L	58	58	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	30	29	4.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	71	70	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EB2307151-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	471	437	7.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1300	1220	6.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11300	10700	5.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	400	382	4.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4933811)									
EB2306934-001	PW2	ED093F: Calcium	7440-70-2	1	mg/L	637	650	1.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	435	447	2.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1170	1200	2.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	39	40	3.0	0% - 20%
EB2306934-010	PW1	ED093F: Calcium	7440-70-2	1	mg/L	670	669	0.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	458	457	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1240	1230	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	41	41	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4933812)									
EB2306934-021	MW73	ED093F: Calcium	7440-70-2	1	mg/L	193	192	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	102	102	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	102	102	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EB2306934-030	MW9	ED093F: Calcium	7440-70-2	1	mg/L	316	299	5.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	633	599	5.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1790	1690	5.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4925527)									
ET2301328-009	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.008	0.009	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2307038-005	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.066	0.065	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 4925527) - continued									
EB2307038-005	Anonymous	EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4925570)									
EB2306934-045	RN13030715	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.08	0.09	0.0	No Limit
EB2306934-041	SW22	EG020A-T: Manganese	7439-96-5	0.001	mg/L	1.94	1.87	3.7	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.63	1.56	4.4	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 4925571)									
EB2306934-008	SW2	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.587	0.587	0.0	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.57	0.57	0.0	0% - 50%
EB2306934-030	MW9	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.390	0.390	0.0	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.41	1.48	4.8	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 4927035)									
EB2306934-012	RN13030692	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2307201-004	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.133	0.134	1.0	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.18	1.23	3.7	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 4933880)									
EB2307198-009	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.037	0.037	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.42	0.49	13.4	No Limit
EB2307048-002	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.047	0.045	5.1	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.32	0.46	35.6	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4926503)									
EB2306934-001	PW2	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.3	1.3	0.0	0% - 50%
EB2306934-011	SW43	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.4	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4926504)									
EB2306934-021	MW73	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EB2306934-031	MW49	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.4	0.4	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4926508)									
EB2306934-041	SW22	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EB2306934-059	BD04_0703	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4938626)									
EB2306934-001	PW2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.03	0.0	No Limit
EB2306934-011	SW43	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.05	70.8	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4938629)									
EB2306934-021	MW73	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-031	MW49	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.08	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4938631)									
EB2306934-041	SW22	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.15	0.15	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4938631) - continued									
EB2306934-059	BD04_0703	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4923024)									
EB2306934-001	PW2	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-011	SW43	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4923029)									
EB2306934-021	MW73	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-031	MW49	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4923032)									
EB2306934-041	SW22	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-059	BD04_0703	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4938627)									
EB2306934-001	PW2	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-011	SW43	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4938628)									
EB2306934-021	MW73	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-031	MW49	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4938630)									
EB2306934-041	SW22	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-059	BD04_0703	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4923023)									
EB2306934-001	PW2	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-011	SW43	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4923028)									
EB2306934-021	MW73	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EB2306934-031	MW49	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4923033)									
EB2306934-041	SW22	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-059	BD04_0703	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4922986)									
EB2306934-008	SW2	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	0.0059	0.0052	13.6	0% - 50%
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0072	0.0078	7.0	0% - 50%
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	0.0043	0.0045	3.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0225	0.0216	3.9	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4922986) - continued									
EB2306934-008	SW2	EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
EB2306934-011	SW43	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	0.0054	0.0064	16.0	No Limit
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0051	0.0044	13.6	No Limit
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0051	0.0057	11.5	No Limit
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4922987)									
EB2306934-022	MW79	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0020	<0.0034	51.9	No Limit
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0058	0.0077	28.5	No Limit
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0030	0.0048	45.7	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0134	0.0204	41.2	No Limit
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
EB2306934-030	MW9	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	0.0531	0.0547	2.9	0% - 20%
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0221	0.0196	12.0	0% - 20%
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	0.0062	0.0062	0.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0407	0.0362	11.9	0% - 20%
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0020	<0.0015	28.6	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4922986)									
EB2306934-008	SW2	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0040	<0.0040	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0080	<0.0080	0.0	No Limit
EB2306934-011	SW43	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.0038	0.0032	18.4	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	0.0035	0.0035	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0035	0.0041	16.4	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0080	<0.0080	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	0.0169	<0.0159	6.1	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4922987)									
EB2306934-022	MW79	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4922987) - continued									
EB2306934-022	MW79	EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0197	<0.0196	0.7	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0039	<0.0039	0.0	No Limit
EB2306934-030	MW9	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0079	<0.0079	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0020	<0.0020	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0395	<0.0396	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4922986)									
EB2306934-008	SW2	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.004	<0.004	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.004	<0.004	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.004	<0.004	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.004	<0.004	0.0	No Limit
EB2306934-011	SW43	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0032	<0.0032	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.008	<0.008	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4922986) - continued									
EB2306934-011	SW43	EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.008	<0.008	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.008	<0.008	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.008	<0.008	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4922987)									
EB2306934-022	MW79	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.002	<0.002	0.0	No Limit
EB2306934-030	MW9	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.002	<0.002	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4922986)									
EB2306934-008	SW2	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4922986) - continued									
EB2306934-008	SW2	EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EB2306934-011	SW43	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.003	<0.003	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.003	<0.003	0.0	No Limit
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.003	<0.003	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.003	<0.003	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4922987)									
EB2306934-022	MW79	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	0.006	0.004	56.9	No Limit
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EB2306934-030	MW9	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4922986)									
EB2306934-008	SW2	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0284	0.0268	5.8	0% - 20%
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.0356	0.0346	2.8	0% - 20%
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	0.0399	0.0391	2.0	0% - 20%
EB2306934-011	SW43	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0105	0.0121	14.2	No Limit
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.0433	0.0273	45.3	0% - 50%
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	0.0433	0.0273	45.3	0% - 50%
EP231P: PFAS Sums (QC Lot: 4922987)									
EB2306934-022	MW79	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0134	# 0.0204	41.4	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4922987) - continued									
EB2306934-022	MW79	EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.0252	# 0.0321	24.1	0% - 20%
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	0.0252	0.0369	37.7	No Limit
EB2306934-030	MW9	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0938	0.0909	3.1	0% - 20%
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.116	0.110	4.8	0% - 50%
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	0.122	0.117	4.5	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4926501)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.8	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 4926506)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 4926510)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4926500)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	97.8	90.0	106
				<1	24800 µS/cm	98.9	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 4926507)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	97.8	90.0	106
				<1	24800 µS/cm	98.4	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 4926511)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	102	90.0	106
				<1	12890 µS/cm	101	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4923279)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	108	88.0	112
				<10	2000 mg/L	97.7	80.9	118
				<10	2340 mg/L	103	80.8	119
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4923281)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	103	88.0	112
				<10	2000 mg/L	99.4	80.9	118
				<10	2340 mg/L	110	80.8	119
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4923284)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	108	88.0	112
				<10	2000 mg/L	98.6	80.9	118
				<10	2340 mg/L	104	80.8	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4923280)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	99.2	82.0	120
				<1	987 mg/L	92.6	84.8	115
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4923282)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4923282) - continued								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	94.1	82.0	120
				<1	987 mg/L	90.3	84.8	115
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4923283)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	103	88.0	112
				<5	1000 mg/L	92.6	88.0	112
				<5	987 mg/L	99.5	84.8	115
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4923285)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	98.9	82.0	120
				<1	987 mg/L	96.1	84.8	115
ED037P: Alkalinity by PC Titrator (QCLot: 4926502)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.7	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 4926505)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	95.3	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 4926509)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	93.0	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923026)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	85.0	118
				<1	100 mg/L	96.6	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923030)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.7	85.0	118
				<1	100 mg/L	89.7	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923034)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.6	85.0	118
				<1	100 mg/L	88.0	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 4923025)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	94.6	90.0	115
				<1	1000 mg/L	102	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 4923027)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	92.9	90.0	115
				<1	1000 mg/L	101	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 4923031)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	92.9	90.0	115
				<1	1000 mg/L	100	90.0	115
ED093F: Dissolved Major Cations (QCLot: 4933808)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	70.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 4933808) - continued								
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Dissolved Major Cations (QCLot: 4933809)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.6	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Dissolved Major Cations (QCLot: 4933811)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	87.3	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.6	70.0	130
ED093F: Dissolved Major Cations (QCLot: 4933812)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	88.8	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.4	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925527)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.7	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	95.6	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 4925570)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	114	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	118	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 4925571)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	113	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	115	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 4927035)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	101	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 4933880)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	103	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 4926503)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	98.0	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 4926504)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	95.2	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 4926508)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	102	80.0	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938626)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	99.8	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938629)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	96.6	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938631)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	97.5	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923024)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	92.8	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923029)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	90.8	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923032)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	90.5	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938627)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.8	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938628)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	94.8	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938630)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.0	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923023)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	105	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923028)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923033)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922986)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	119	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	126	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	115	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	130	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	110	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	104	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922987)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	96.9	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	107	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	89.9	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	117	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	115	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	114	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922993)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	115	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	126	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	104	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	123	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	136	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	118	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4924164)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	121	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	127	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	112	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	122	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	140	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	130	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922986)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	106	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	114	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	115	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	113	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	120	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	112	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	120	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	110	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	124	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	110	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	111	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922987)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	94.4	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	103	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	95.2	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	95.6	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	90.4	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	96.8	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	105	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	102	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	93.6	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	91.6	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	110	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922993)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922993) - continued								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	84.8	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	85.2	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	105	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	126	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	112	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	114	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	98.4	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	96.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	122	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	118	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	114	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4924164)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	120	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	119	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	121	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	116	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	118	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	119	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	118	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	110	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	118	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	115	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922986)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	113	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	133	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	134	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	118	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	110	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	135	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	122	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922987)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	104	67.0	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922987) - continued								
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	93.4	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	80.6	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	88.0	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	89.3	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	109	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	106	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922993)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	119	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	# 178	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	# 160	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	# 143	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	135	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	115	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	118	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4924164)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	113	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	125	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	123	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	133	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	119	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	119	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	120	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922986)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	129	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	122	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	104	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	93.7	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922987)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	112	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	116	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	97.5	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	93.7	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922993)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	# 152	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	128	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	121	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	97.8	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4924164)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	104	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	118	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	127	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	130	53.1	133
EP231P: PFAS Sums (QCLot: 4922986)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 4922987)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 4922993)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 4924164)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 4924164) - continued								
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923026)							
EB2306934-002	Notch-V1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923030)							
EB2306934-022	MW79	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923034)							
EB2306934-042	MW69	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	98.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4923025)							
EB2306934-002	Notch-V1	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4923027)							
EB2306934-022	MW79	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4923031)							
EB2306934-042	MW69	ED045G: Chloride	16887-00-6	400 mg/L	94.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925527)							
ET2301328-001	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	93.1	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925570)							
EB2306934-060	BD04_0803	EG020A-T: Manganese	7439-96-5	1 mg/L	110	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925571)							
EB2306934-014	MW77	EG020A-T: Manganese	7439-96-5	1 mg/L	99.9	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4927035)							
EB2306934-006	SW36	EG020A-T: Manganese	7439-96-5	1 mg/L	109	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4933880)							
EB2307048-002	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	98.7	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK040P: Fluoride by PC Titrator (QCLot: 4926503)							
EB2306934-002	Notch-V1	EK040P: Fluoride	16984-48-8	10 mg/L	87.4	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4926504)							
EB2306934-022	MW79	EK040P: Fluoride	16984-48-8	5 mg/L	73.2	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4926508)							
EB2306934-042	MW69	EK040P: Fluoride	16984-48-8	5 mg/L	102	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938626)							
EB2306934-002	Notch-V1	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	120	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938629)							
EB2306934-022	MW79	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	109	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938631)							
EB2306934-042	MW69	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	103	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923024)							
EB2306934-002	Notch-V1	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	86.6	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923029)							
EB2306934-022	MW79	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	87.2	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923032)							
EB2306934-042	MW69	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	88.4	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938627)							
EB2306934-002	Notch-V1	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	87.6	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938628)							
EB2306934-022	MW79	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	101	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938630)							
EB2306934-042	MW69	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	96.1	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923023)							
EB2306934-002	Notch-V1	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	94.4	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923028)							
EB2306934-022	MW79	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	87.5	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923033)							
EB2306934-042	MW69	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	91.9	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922986)							
EB2306934-009	DRD	EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00355 µg/L	120	70.0	130
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00376 µg/L	114	70.0	130
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00379 µg/L	83.1	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922986) - continued							
EB2306934-009	DRD	EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00381 µg/L	115	70.0	130
		EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00371 µg/L	106	70.0	130
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00385 µg/L	103	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922987)							
EB2306934-024	MW43	EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00355 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00376 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00379 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00381 µg/L	124	70.0	130
		EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00371 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00385 µg/L	111	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922986)							
EB2306934-009	DRD	EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.02 µg/L	80.8	70.0	130
		EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.004 µg/L	70.0	70.0	130
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.004 µg/L	88.0	70.0	130
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.004 µg/L	98.4	70.0	130
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.004 µg/L	94.4	70.0	130
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.004 µg/L	114	70.0	130
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.004 µg/L	114	70.0	130
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.004 µg/L	110	70.0	130
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.004 µg/L	88.0	70.0	130
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.004 µg/L	88.0	70.0	130
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.01 µg/L	87.2	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922987)							
EB2306934-024	MW43	EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.02 µg/L	85.8	70.0	130
		EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.004 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.004 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.004 µg/L	81.1	70.0	130
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.004 µg/L	96.8	70.0	130
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.004 µg/L	107	70.0	130
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.004 µg/L	114	70.0	130
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.004 µg/L	108	70.0	130
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.004 µg/L	99.3	70.0	130
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.004 µg/L	96.3	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922987) - continued							
EB2306934-024	MW43	EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.01 µg/L	111	70.0	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922986)							
EB2306934-009	DRD	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.004 µg/L	116	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.01 µg/L	95.2	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.01 µg/L	80.0	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.01 µg/L	109	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.01 µg/L	107	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.004 µg/L	88.0	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.004 µg/L	96.0	70.0	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922987)							
EB2306934-024	MW43	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.004 µg/L	114	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.01 µg/L	110	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.01 µg/L	104	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.01 µg/L	103	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.01 µg/L	108	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.004 µg/L	111	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.004 µg/L	111	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922986)							
EB2306934-009	DRD	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00374 µg/L	111	70.0	130
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0038 µg/L	120	70.0	130
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00384 µg/L	107	70.0	130
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00386 µg/L	88.3	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922987)							
EB2306934-024	MW43	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00374 µg/L	123	70.0	130
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0038 µg/L	114	70.0	130
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00384 µg/L	114	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922987) - continued							
EB2306934-024	MW43	EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00386 µg/L	104	70.0	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2306934-AB**	Page	: 1 of 6
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023
Order number	: ----	Date Analysis Commenced	: 10-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUARTERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
No. of samples analysed	: 1		

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Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4926510)									
EB2306934-041	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.07	8.13	0.7	0% - 20%
EB2306934-059	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.04	8.10	0.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4926511)									
EB2306934-041	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1090	1090	0.1	0% - 20%
EB2306934-059	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	839	842	0.4	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4926509)									
EB2306934-041	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	148	150	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	148	150	1.3	0% - 20%
EB2306934-059	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	173	173	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	173	173	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4923034)									
EB2306934-041	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	30	30	0.0	0% - 20%
EB2306934-059	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	41	41	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4923031)									
EB2306934-041	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	250	250	0.0	0% - 20%
EB2306934-059	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	137	138	0.7	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4933808)									
EB2306820-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	34	33	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	28	27	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4933808) - continued									
EB2306820-001	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	94	93	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EB2306842-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	33	37	11.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	16	9.4	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	47	51	7.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4925527)									
ET2301328-009	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.008	0.009	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2307038-005	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.066	0.065	0.0	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4926508)									
EB2306934-041	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EB2306934-059	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4938631)									
EB2306934-041	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.15	0.15	0.0	0% - 50%
EB2306934-059	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4923032)									
EB2306934-041	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-059	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4938630)									
EB2306934-041	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-059	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4923033)									
EB2306934-041	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-059	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4926510)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4926511)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	102	90.0	106
				<1	12890 µS/cm	101	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4923284)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	108	88.0	112
				<10	2000 mg/L	98.6	80.9	118
				<10	2340 mg/L	104	80.8	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4923285)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	98.9	82.0	120
				<1	987 mg/L	96.1	84.8	115
ED037P: Alkalinity by PC Titrator (QCLot: 4926509)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	93.0	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923034)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.6	85.0	118
				<1	100 mg/L	88.0	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 4923031)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	92.9	90.0	115
				<1	1000 mg/L	100	90.0	115
ED093F: Dissolved Major Cations (QCLot: 4933808)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925527)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.7	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	95.6	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 4926508)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	102	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938631)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	97.5	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923032)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923032) - continued								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	90.5	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938630)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.0	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923033)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922993)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	115	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	126	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	104	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	123	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	136	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	118	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922993)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	84.8	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	85.2	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	105	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	126	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	112	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	114	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	98.4	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	96.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	122	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	118	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922993)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	119	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	# 178	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	# 160	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	# 143	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	135	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	115	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	118	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922993)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	# 152	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	128	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	121	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	97.8	53.1	133
EP231P: PFAS Sums (QCLot: 4922993)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923034)							
EB2306934-042	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	98.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4923031)							
EB2306934-042	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	94.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925527)							
ET2301328-001	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	93.1	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4926508)							
EB2306934-042	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	102	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938631)							
EB2306934-042	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	103	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923032)							
EB2306934-042	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	88.4	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938630)							
EB2306934-042	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	96.1	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923033)							
EB2306934-042	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	91.9	70.0	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2306934-AC**	Page	: 1 of 11
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023
Order number	: ----	Date Analysis Commenced	: 10-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUARTERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4926506)									
EB2306934-021	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.76	7.75	0.1	0% - 20%
EB2306934-031	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.78	7.78	0.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4926507)									
EB2306934-021	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2320	2310	0.5	0% - 20%
EB2306934-031	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	17300	17400	0.2	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4926505)									
EB2306934-021	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	186	187	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	186	187	0.6	0% - 20%
EB2306934-031	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	695	699	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	695	699	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4923030)									
EB2306934-021	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	101	101	0.0	0% - 20%
EB2306934-031	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1020	1020	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4923027)									
EB2306934-021	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	604	618	2.4	0% - 20%
EB2306934-031	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	5540	5560	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4933812)									
EB2306934-021	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	193	192	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	102	102	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4933812) - continued									
EB2306934-021	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	102	102	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EB2306934-030	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	316	299	5.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	633	599	5.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1790	1690	5.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4925570)									
EB2306934-045	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.08	0.09	0.0	No Limit
EB2306934-041	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	1.94	1.87	3.7	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.63	1.56	4.4	0% - 20%
EK040P: Fluoride by PC Titrator (QC Lot: 4926504)									
EB2306934-021	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EB2306934-031	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.4	0.4	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4938629)									
EB2306934-021	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-031	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.08	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4923029)									
EB2306934-021	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-031	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4938628)									
EB2306934-021	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-031	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4923028)									
EB2306934-021	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EB2306934-031	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4922987)									
EB2306934-022	Anonymous	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0020	<0.0034	51.9	No Limit
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0058	0.0077	28.5	No Limit
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0030	0.0048	45.7	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0134	0.0204	41.2	No Limit
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4922987) - continued									
EB2306934-030	Anonymous	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	0.0531	0.0547	2.9	0% - 20%
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0221	0.0196	12.0	0% - 20%
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	0.0062	0.0062	0.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0407	0.0362	11.9	0% - 20%
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0020	<0.0015	28.6	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4922987)									
EB2306934-022	Anonymous	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0197	<0.0196	0.7	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0039	<0.0039	0.0	No Limit
EB2306934-030	Anonymous	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0079	<0.0079	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0020	<0.0020	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0395	<0.0396	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4922987)									
EB2306934-022	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.002	<0.002	0.0	No Limit
EB2306934-030	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0008	<0.0008	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.002	<0.002	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4922987)									
EB2306934-022	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	0.006	0.004	56.9	No Limit
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EB2306934-030	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4922987) - continued									
EB2306934-030	Anonymous	EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4922987)									
EB2306934-022	Anonymous	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0134	# 0.0204	41.4	0% - 20%
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.0252	# 0.0321	24.1	0% - 20%
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	0.0252	0.0369	37.7	No Limit
EB2306934-030	Anonymous	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0938	0.0909	3.1	0% - 20%
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.116	0.110	4.8	0% - 50%
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	0.122	0.117	4.5	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4926506)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4926507)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	97.8	90.0	106
				<1	24800 µS/cm	98.4	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4923281)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	103	88.0	112
				<10	2000 mg/L	99.4	80.9	118
				<10	2340 mg/L	110	80.8	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4923282)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	94.1	82.0	120
				<1	987 mg/L	90.3	84.8	115
ED037P: Alkalinity by PC Titrator (QCLot: 4926505)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	95.3	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923030)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.7	85.0	118
				<1	100 mg/L	89.7	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 4923027)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	92.9	90.0	115
				<1	1000 mg/L	101	90.0	115
ED093F: Dissolved Major Cations (QCLot: 4933812)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	88.8	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.4	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925570)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	114	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	118	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 4926504)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	95.2	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938629)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	96.6	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923029)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923029) - continued								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	90.8	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938628)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	94.8	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923028)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922987)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	96.9	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	107	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	89.9	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	117	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	115	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	114	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922987)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	94.4	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	103	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	95.2	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	95.6	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	90.4	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	96.8	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	105	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	102	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	93.6	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	91.6	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922987)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	104	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	93.4	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	80.6	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	88.0	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	89.3	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	109	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	106	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922987)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	112	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	116	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	97.5	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	93.7	53.1	133
EP231P: PFAS Sums (QCLot: 4922987)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923030)							
EB2306934-022	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4923027)							
EB2306934-022	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925570)							
EB2306934-060	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	110	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4926504)							
EB2306934-022	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	73.2	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938629)							
EB2306934-022	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	109	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923029)							
EB2306934-022	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	87.2	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938628)							
EB2306934-022	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	101	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923028)							
EB2306934-022	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	87.5	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922987)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922987) - continued							
EB2306934-024	Anonymous	EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00355 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00376 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00379 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00381 µg/L	124	70.0	130
		EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00371 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00385 µg/L	111	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922987)							
EB2306934-024	Anonymous	EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.02 µg/L	85.8	70.0	130
		EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.004 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.004 µg/L	# Not Determined	70.0	130
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.004 µg/L	81.1	70.0	130
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.004 µg/L	96.8	70.0	130
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.004 µg/L	107	70.0	130
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.004 µg/L	114	70.0	130
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.004 µg/L	108	70.0	130
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.004 µg/L	99.3	70.0	130
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.004 µg/L	96.3	70.0	130
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.01 µg/L	111	70.0	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922987)							
EB2306934-024	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.004 µg/L	114	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.01 µg/L	110	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.01 µg/L	104	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.01 µg/L	103	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.01 µg/L	108	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.004 µg/L	111	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.004 µg/L	111	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922987)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922987) - continued							
EB2306934-024	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00374 µg/L	123	70.0	130
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0038 µg/L	114	70.0	130
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00384 µg/L	114	70.0	130
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00386 µg/L	104	70.0	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2306934-AD**	Page	: 1 of 6
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023
Order number	: ----	Date Analysis Commenced	: 10-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUARTERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4926510)									
EB2306934-041	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.07	8.13	0.7	0% - 20%
EB2306934-059	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.04	8.10	0.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4926511)									
EB2306934-041	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1090	1090	0.1	0% - 20%
EB2306934-059	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	839	842	0.4	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4926509)									
EB2306934-041	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	148	150	1.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	148	150	1.3	0% - 20%
EB2306934-059	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	173	173	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	173	173	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4923034)									
EB2306934-041	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	30	30	0.0	0% - 20%
EB2306934-059	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	41	41	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4923031)									
EB2306934-041	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	250	250	0.0	0% - 20%
EB2306934-059	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	137	138	0.7	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4933808)									
EB2306820-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	34	33	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	28	27	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4933808) - continued									
EB2306820-001	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	94	93	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	6	6	0.0	No Limit
EB2306842-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	33	37	11.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	14	16	9.4	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	47	51	7.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4925527)									
ET2301328-009	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.008	0.009	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2307038-005	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.066	0.065	0.0	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 4926508)									
EB2306934-041	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EB2306934-059	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4938631)									
EB2306934-041	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.15	0.15	0.0	0% - 50%
EB2306934-059	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4923032)									
EB2306934-041	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-059	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4938630)									
EB2306934-041	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-059	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4923033)									
EB2306934-041	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-059	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4926510)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4926511)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	102	90.0	106
				<1	12890 µS/cm	101	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4923284)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	108	88.0	112
				<10	2000 mg/L	98.6	80.9	118
				<10	2340 mg/L	104	80.8	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4923285)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	98.9	82.0	120
				<1	987 mg/L	96.1	84.8	115
ED037P: Alkalinity by PC Titrator (QCLot: 4926509)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	93.0	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923034)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.6	85.0	118
				<1	100 mg/L	88.0	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 4923031)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	92.9	90.0	115
				<1	1000 mg/L	100	90.0	115
ED093F: Dissolved Major Cations (QCLot: 4933808)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925527)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.7	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	95.6	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 4926508)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	102	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938631)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	97.5	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923032)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923032) - continued								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	90.5	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938630)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.0	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923033)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922993)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	115	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	126	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	104	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	123	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	136	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	118	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922993)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	84.8	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	85.2	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	105	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	126	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	112	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	114	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	98.4	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	96.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	122	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	118	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922993)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	119	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	# 178	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	# 160	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	# 143	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	135	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	115	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	118	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922993)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	# 152	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	128	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	121	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	97.8	53.1	133
EP231P: PFAS Sums (QCLot: 4922993)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923034)							
EB2306934-042	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	98.4	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4923031)							
EB2306934-042	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	94.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925527)							
ET2301328-001	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	93.1	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4926508)							
EB2306934-042	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	102	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938631)							
EB2306934-042	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	103	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923032)							
EB2306934-042	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	88.4	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938630)							
EB2306934-042	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	96.1	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923033)							
EB2306934-042	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	91.9	70.0	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2306934-AE**	Page	: 1 of 6
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023
Order number	: ----	Date Analysis Commenced	: 10-Mar-2023
C-O-C number	: ----	Issue Date	: 21-Mar-2023
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUARTERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 4926506)									
EB2306934-021	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.76	7.75	0.1	0% - 20%
EB2306934-031	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.78	7.78	0.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4926507)									
EB2306934-021	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2320	2310	0.5	0% - 20%
EB2306934-031	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	17300	17400	0.2	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4926505)									
EB2306934-021	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	186	187	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	186	187	0.6	0% - 20%
EB2306934-031	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	695	699	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	695	699	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4923030)									
EB2306934-021	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	101	101	0.0	0% - 20%
EB2306934-031	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1020	1020	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4923027)									
EB2306934-021	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	604	618	2.4	0% - 20%
EB2306934-031	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	5540	5560	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4933812)									
EB2306934-021	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	193	192	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	102	102	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 4933812) - continued									
EB2306934-021	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	102	102	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EB2306934-030	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	316	299	5.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	633	599	5.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1790	1690	5.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 4925570)									
EB2306934-045	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.08	0.09	0.0	No Limit
EB2306934-041	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	1.94	1.87	3.7	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.63	1.56	4.4	0% - 20%
EK040P: Fluoride by PC Titrator (QC Lot: 4926504)									
EB2306934-021	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EB2306934-031	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.4	0.4	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 4938629)									
EB2306934-021	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-031	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.08	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 4923029)									
EB2306934-021	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-031	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 4938628)									
EB2306934-021	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2306934-031	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 4923028)									
EB2306934-021	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EB2306934-031	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4926506)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4926507)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	97.8	90.0	106
				<1	24800 µS/cm	98.4	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 4923281)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	103	88.0	112
				<10	2000 mg/L	99.4	80.9	118
				<10	2340 mg/L	110	80.8	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 4923282)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	94.1	82.0	120
				<1	987 mg/L	90.3	84.8	115
ED037P: Alkalinity by PC Titrator (QCLot: 4926505)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	95.3	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923030)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.7	85.0	118
				<1	100 mg/L	89.7	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 4923027)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	92.9	90.0	115
				<1	1000 mg/L	101	90.0	115
ED093F: Dissolved Major Cations (QCLot: 4933812)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	88.8	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.4	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925570)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	114	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	118	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 4926504)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	95.2	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938629)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	96.6	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923029)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923029) - continued								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	90.8	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938628)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	94.8	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923028)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4922993)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	115	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	126	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	104	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	123	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	136	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	118	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4922993)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	84.8	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	85.2	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	105	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	126	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	112	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	114	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	98.4	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	96.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	122	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	118	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4922993)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	119	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	# 178	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	# 160	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	# 143	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	135	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	115	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	118	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4922993)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	# 152	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	128	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	121	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	97.8	53.1	133
EP231P: PFAS Sums (QCLot: 4922993)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4923030)							
EB2306934-022	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4923027)							
EB2306934-022	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 4925570)							
EB2306934-060	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	110	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 4926504)							
EB2306934-022	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	73.2	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 4938629)							
EB2306934-022	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	109	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 4923029)							
EB2306934-022	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	87.2	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 4938628)							
EB2306934-022	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	101	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 4923028)							
EB2306934-022	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	87.5	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2306934**	Page	: 1 of 38
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 10-Mar-2023
Site	: CALLIDE QUARTERLY MONITORING	Issue Date	: 21-Mar-2023
Sampler	: DANIEL PAPINCZAK	No. of samples received	: 60
Order number	: ----	No. of samples analysed	: 60

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231P: PFAS Sums	EB2306934--022	MW79	**Sum of PFHxS and PFOS**	355-46-4/1763-23-1	41.4 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EB2306934--022	MW79	**Sum of PFAS (WA DER List)**	----	24.1 %	0% - 20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-4922993-002	----	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	178 %	68.0-141%	**Recovery greater than upper control limit**
EP231C: Perfluoroalkyl Sulfonamides	QC-4922993-002	----	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	160 %	57.9-141%	**Recovery greater than upper control limit**
EP231C: Perfluoroalkyl Sulfonamides	QC-4922993-002	----	**N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)**	24448-09-7	143 %	63.3-134%	**Recovery greater than upper control limit**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	QC-4922993-002	----	**4:2 Fluorotelomer sulfonic acid (4:2 FTS)**	757124-72-4	152 %	63.0-143%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2306934--002	Notch-V1	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2306934--022	MW79	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2306934--002	Notch-V1	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2306934--022	MW79	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2306934--024	MW43	**Perfluorobutane sulfonic acid (PFBS)**	375-73-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2306934--024	MW43	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries - Continued							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2306934--024	MW43	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2306934--024	MW43	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EB2306934--024	MW43	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EB2306934--024	MW43	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / **Container** / Client Sample ID(s)		*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
RN13030692,	RN13030698,	----	----	----	14-Mar-2023	01-Mar-2023	**13**
MW77,	MW40,						
BD01_2902							
Clear Plastic Bottle - Natural							
MW1,	MW74,	----	----	----	14-Mar-2023	02-Mar-2023	**12**
ESC3,	MW11,						
MW72,	MW73,						
MW79,	MW80,						
BD02_0203							
Clear Plastic Bottle - Natural							
MW43,	MW68,	----	----	----	14-Mar-2023	03-Mar-2023	**11**
ESC4,	MW75,						
MW76,	MW78,						
MW9,	MW49,						
BD03_0303							
Clear Plastic Bottle - Natural							
L006-B05,	MW31,	----	----	----	14-Mar-2023	04-Mar-2023	**10**
MW32							
Clear Plastic Bottle - Natural							
MW23,	MW66,	----	----	----	14-Mar-2023	06-Mar-2023	**8**
RN13030697,	SW41,						
RN13030126,	L021-B01						

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA005P: pH by PC Titrator - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	----	----	----	14-Mar-2023	07-Mar-2023	**7**
Clear Plastic Bottle - Natural L012-B01, BD04_0803	----	----	----	14-Mar-2023	08-Mar-2023	**6**
Clear Plastic Bottle - Natural PW2, Notch-V1, SW13, Notch-V2	----	----	----	14-Mar-2023	27-Feb-2023	**15**
Clear Plastic Bottle - Natural SW20, SW36, SW12, SW2, DRD, PW1, SW43	----	----	----	14-Mar-2023	28-Feb-2023	**14**
EA015: Total Dissolved Solids dried at 180 ± 5 °C						
Clear Plastic Bottle - Natural RN13030692, RN13030698, MW77, MW40, BD01_2902	----	----	----	15-Mar-2023	08-Mar-2023	**7**
Clear Plastic Bottle - Natural MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	----	----	----	15-Mar-2023	09-Mar-2023	**6**
Clear Plastic Bottle - Natural MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	----	----	----	15-Mar-2023	10-Mar-2023	**5**
Clear Plastic Bottle - Natural L006-B05, MW31, MW32	----	----	----	15-Mar-2023	11-Mar-2023	**4**
Clear Plastic Bottle - Natural MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	----	----	----	15-Mar-2023	13-Mar-2023	**2**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA015: Total Dissolved Solids dried at 180 ± 5 °C - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	----	----	----	15-Mar-2023	14-Mar-2023	**1**
Clear Plastic Bottle - Natural PW2, Notch-V1, SW13, Notch-V2	----	----	----	15-Mar-2023	06-Mar-2023	**9**
Clear Plastic Bottle - Natural SW20, SW36, SW12, SW2, DRD, PW1, SW43	----	----	----	15-Mar-2023	07-Mar-2023	**8**
EA025: Total Suspended Solids dried at 104 ± 2°C						
Clear Plastic Bottle - Natural RN13030692, RN13030698, MW77, MW40, BD01_2902	----	----	----	15-Mar-2023	08-Mar-2023	**7**
Clear Plastic Bottle - Natural MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	----	----	----	15-Mar-2023	09-Mar-2023	**6**
Clear Plastic Bottle - Natural MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	----	----	----	15-Mar-2023	10-Mar-2023	**5**
Clear Plastic Bottle - Natural L006-B05, MW31, MW32	----	----	----	15-Mar-2023	11-Mar-2023	**4**
Clear Plastic Bottle - Natural MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	----	----	----	15-Mar-2023	13-Mar-2023	**2**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA025: Total Suspended Solids dried at 104 ± 2°C - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	----	----	----	15-Mar-2023	14-Mar-2023	**1**
Clear Plastic Bottle - Natural						
PW2, Notch-V1, SW13, Notch-V2	----	----	----	15-Mar-2023	06-Mar-2023	**9**
Clear Plastic Bottle - Natural						
SW20, SW36, SW12, SW2, DRD, PW1, SW43	----	----	----	15-Mar-2023	07-Mar-2023	**8**
ED037P: Alkalinity by PC Titrator						
Clear Plastic Bottle - Natural						
PW2, Notch-V1, SW13, Notch-V2	----	----	----	14-Mar-2023	13-Mar-2023	**1**
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
RN13030692, RN13030698, MW77, MW40, BD01_2902	----	----	----	17-Mar-2023	08-Mar-2023	**9**
Clear Plastic Bottle - Natural						
MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	----	----	----	17-Mar-2023	09-Mar-2023	**8**
Clear Plastic Bottle - Natural						
MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	----	----	----	17-Mar-2023	10-Mar-2023	**7**
Clear Plastic Bottle - Natural						
L006-B05, MW31, MW32	----	----	----	17-Mar-2023	11-Mar-2023	**6**
Clear Plastic Bottle - Natural						
MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	----	----	----	17-Mar-2023	13-Mar-2023	**4**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	----	----	----	17-Mar-2023	14-Mar-2023	**3**
Clear Plastic Bottle - Natural						
L012-B01, BD04_0803	----	----	----	17-Mar-2023	15-Mar-2023	**2**
Clear Plastic Bottle - Natural						
PW2, Notch-V1, SW13, Notch-V2	----	----	----	17-Mar-2023	06-Mar-2023	**11**
Clear Plastic Bottle - Natural						
SW20, SW36, SW12, SW2, DRD, PW1, SW43	----	----	----	17-Mar-2023	07-Mar-2023	**10**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
RN13030692, RN13030698, MW77, MW40, BD01_2902	----	----	----	15-Mar-2023	03-Mar-2023	**12**
Clear Plastic Bottle - Natural						
MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	----	----	----	15-Mar-2023	04-Mar-2023	**11**
Clear Plastic Bottle - Natural						
MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	----	----	----	15-Mar-2023	05-Mar-2023	**10**
Clear Plastic Bottle - Natural						
L006-B05, MW31, MW32	----	----	----	15-Mar-2023	06-Mar-2023	**9**
Clear Plastic Bottle - Natural						
MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	----	----	----	15-Mar-2023	08-Mar-2023	**7**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK057G: Nitrite as N by Discrete Analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	----	----	----	15-Mar-2023	09-Mar-2023	**6**
Clear Plastic Bottle - Natural L012-B01, BD04_0803	----	----	----	15-Mar-2023	10-Mar-2023	**5**
Clear Plastic Bottle - Natural PW2, Notch-V1, SW13, Notch-V2	----	----	----	15-Mar-2023	01-Mar-2023	**14**
Clear Plastic Bottle - Natural SW20, SW36, SW12, SW2, DRD, PW1, SW43	----	----	----	15-Mar-2023	02-Mar-2023	**13**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural RN13030692, RN13030698, MW77, MW40, BD01_2902	----	----	----	15-Mar-2023	03-Mar-2023	**12**
Clear Plastic Bottle - Natural MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	----	----	----	15-Mar-2023	04-Mar-2023	**11**
Clear Plastic Bottle - Natural MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	----	----	----	15-Mar-2023	05-Mar-2023	**10**
Clear Plastic Bottle - Natural L006-B05, MW31, MW32	----	----	----	15-Mar-2023	06-Mar-2023	**9**
Clear Plastic Bottle - Natural MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	----	----	----	15-Mar-2023	08-Mar-2023	**7**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK071G: Reactive Phosphorus as P by discrete analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	----	----	----	15-Mar-2023	09-Mar-2023	**6**
Clear Plastic Bottle - Natural L012-B01, BD04_0803	----	----	----	15-Mar-2023	10-Mar-2023	**5**
Clear Plastic Bottle - Natural PW2, Notch-V1, SW13, Notch-V2	----	----	----	15-Mar-2023	01-Mar-2023	**14**
Clear Plastic Bottle - Natural SW20, SW36, SW12, SW2, DRD, PW1, SW43	----	----	----	15-Mar-2023	02-Mar-2023	**13**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	4	63	6.35	10.00	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	0	51	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	0	52	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	63	3.17	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**14-Mar-2023**	01-Mar-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**14-Mar-2023**	02-Mar-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**14-Mar-2023**	03-Mar-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**14-Mar-2023**	04-Mar-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**14-Mar-2023**	06-Mar-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**14-Mar-2023**	07-Mar-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**14-Mar-2023**	08-Mar-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**14-Mar-2023**	27-Feb-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**14-Mar-2023**	28-Feb-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**14-Mar-2023**	29-Mar-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**14-Mar-2023**	30-Mar-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**14-Mar-2023**	31-Mar-2023	✓
Clear Plastic Bottle - Natural (EA010-P) L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**14-Mar-2023**	01-Apr-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**14-Mar-2023**	03-Apr-2023	✓
Clear Plastic Bottle - Natural (EA010-P) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**14-Mar-2023**	04-Apr-2023	✓
Clear Plastic Bottle - Natural (EA010-P) L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**14-Mar-2023**	05-Apr-2023	✓
Clear Plastic Bottle - Natural (EA010-P) PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**14-Mar-2023**	27-Mar-2023	✓
Clear Plastic Bottle - Natural (EA010-P) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**14-Mar-2023**	28-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H) RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**15-Mar-2023**	08-Mar-2023	×
Clear Plastic Bottle - Natural (EA015H) MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**15-Mar-2023**	09-Mar-2023	×
Clear Plastic Bottle - Natural (EA015H) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**15-Mar-2023**	10-Mar-2023	×
Clear Plastic Bottle - Natural (EA015H) L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**15-Mar-2023**	11-Mar-2023	×
Clear Plastic Bottle - Natural (EA015H) MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**15-Mar-2023**	13-Mar-2023	×
Clear Plastic Bottle - Natural (EA015H) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**15-Mar-2023**	14-Mar-2023	×
Clear Plastic Bottle - Natural (EA015H) L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**15-Mar-2023**	15-Mar-2023	✓
Clear Plastic Bottle - Natural (EA015H) PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**15-Mar-2023**	06-Mar-2023	×
Clear Plastic Bottle - Natural (EA015H) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**15-Mar-2023**	07-Mar-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025LL) RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**15-Mar-2023**	08-Mar-2023	×
Clear Plastic Bottle - Natural (EA025LL) MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**15-Mar-2023**	09-Mar-2023	×
Clear Plastic Bottle - Natural (EA025LL) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**15-Mar-2023**	10-Mar-2023	×
Clear Plastic Bottle - Natural (EA025LL) L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**15-Mar-2023**	11-Mar-2023	×
Clear Plastic Bottle - Natural (EA025LL) MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**15-Mar-2023**	13-Mar-2023	×
Clear Plastic Bottle - Natural (EA025LL) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**15-Mar-2023**	14-Mar-2023	×
Clear Plastic Bottle - Natural (EA025LL) L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**15-Mar-2023**	15-Mar-2023	✓
Clear Plastic Bottle - Natural (EA025LL) PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**15-Mar-2023**	06-Mar-2023	×
Clear Plastic Bottle - Natural (EA025LL) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**15-Mar-2023**	07-Mar-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**14-Mar-2023**	15-Mar-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**14-Mar-2023**	16-Mar-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**14-Mar-2023**	17-Mar-2023	✓
Clear Plastic Bottle - Natural (ED037-P) L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**14-Mar-2023**	18-Mar-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**14-Mar-2023**	20-Mar-2023	✓
Clear Plastic Bottle - Natural (ED037-P) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**14-Mar-2023**	21-Mar-2023	✓
Clear Plastic Bottle - Natural (ED037-P) L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**14-Mar-2023**	22-Mar-2023	✓
Clear Plastic Bottle - Natural (ED037-P) PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**14-Mar-2023**	13-Mar-2023	×
Clear Plastic Bottle - Natural (ED037-P) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**14-Mar-2023**	14-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**15-Mar-2023**	29-Mar-2023	✓
Clear Plastic Bottle - Natural (ED041G) MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**15-Mar-2023**	30-Mar-2023	✓
Clear Plastic Bottle - Natural (ED041G) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**15-Mar-2023**	31-Mar-2023	✓
Clear Plastic Bottle - Natural (ED041G) L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**15-Mar-2023**	01-Apr-2023	✓
Clear Plastic Bottle - Natural (ED041G) MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**15-Mar-2023**	03-Apr-2023	✓
Clear Plastic Bottle - Natural (ED041G) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**15-Mar-2023**	04-Apr-2023	✓
Clear Plastic Bottle - Natural (ED041G) L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**15-Mar-2023**	05-Apr-2023	✓
Clear Plastic Bottle - Natural (ED041G) PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**15-Mar-2023**	27-Mar-2023	✓
Clear Plastic Bottle - Natural (ED041G) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**15-Mar-2023**	28-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**15-Mar-2023**	29-Mar-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**15-Mar-2023**	30-Mar-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**15-Mar-2023**	31-Mar-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**15-Mar-2023**	01-Apr-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**15-Mar-2023**	03-Apr-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**15-Mar-2023**	04-Apr-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**15-Mar-2023**	05-Apr-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**15-Mar-2023**	27-Mar-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**15-Mar-2023**	28-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**17-Mar-2023**	08-Mar-2023	×
Clear Plastic Bottle - Natural (ED093F)							
MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**17-Mar-2023**	09-Mar-2023	×
Clear Plastic Bottle - Natural (ED093F)							
MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**17-Mar-2023**	10-Mar-2023	×
Clear Plastic Bottle - Natural (ED093F)							
L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**17-Mar-2023**	11-Mar-2023	×
Clear Plastic Bottle - Natural (ED093F)							
MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**17-Mar-2023**	13-Mar-2023	×
Clear Plastic Bottle - Natural (ED093F)							
SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**17-Mar-2023**	14-Mar-2023	×
Clear Plastic Bottle - Natural (ED093F)							
L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**17-Mar-2023**	15-Mar-2023	×
Clear Plastic Bottle - Natural (ED093F)							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**17-Mar-2023**	06-Mar-2023	×
Clear Plastic Bottle - Natural (ED093F)							
SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**17-Mar-2023**	07-Mar-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) BD01_2902	**01-Mar-2023**	**13-Mar-2023**	28-Aug-2023	✓	**16-Mar-2023**	28-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) RN13030698, MW77, MW40	**01-Mar-2023**	**13-Mar-2023**	28-Aug-2023	✓	**18-Mar-2023**	28-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) RN13030692	**01-Mar-2023**	**14-Mar-2023**	28-Aug-2023	✓	**16-Mar-2023**	28-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) BD02_0203	**02-Mar-2023**	**13-Mar-2023**	29-Aug-2023	✓	**16-Mar-2023**	29-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW1, MW74, MW11, MW72, MW73, MW79, MW80	**02-Mar-2023**	**13-Mar-2023**	29-Aug-2023	✓	**18-Mar-2023**	29-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) ESC3	**02-Mar-2023**	**14-Mar-2023**	29-Aug-2023	✓	**16-Mar-2023**	29-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) BD03_0303	**03-Mar-2023**	**13-Mar-2023**	30-Aug-2023	✓	**16-Mar-2023**	30-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49	**03-Mar-2023**	**13-Mar-2023**	30-Aug-2023	✓	**18-Mar-2023**	30-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) L006-B05, MW31, MW32	**04-Mar-2023**	**13-Mar-2023**	31-Aug-2023	✓	**18-Mar-2023**	31-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW23, MW66, RN13030697, RN13030126, L021-B01	**06-Mar-2023**	**13-Mar-2023**	02-Sep-2023	✓	**18-Mar-2023**	02-Sep-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) SW41	**06-Mar-2023**	**17-Mar-2023**	02-Sep-2023	✓	**17-Mar-2023**	02-Sep-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW69, L005-B01	**07-Mar-2023**	**13-Mar-2023**	03-Sep-2023	✓	**16-Mar-2023**	03-Sep-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) SW22, RN13030127, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**13-Mar-2023**	03-Sep-2023	✓	**18-Mar-2023**	03-Sep-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) L012-B01	**08-Mar-2023**	**13-Mar-2023**	04-Sep-2023	✓	**16-Mar-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) BD04_0803	**08-Mar-2023**	**13-Mar-2023**	04-Sep-2023	✓	**18-Mar-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS - Continued							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**13-Mar-2023**	26-Aug-2023	✓	**18-Mar-2023**	26-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
SW12, SW2, DRD, PW1	**28-Feb-2023**	**13-Mar-2023**	27-Aug-2023	✓	**18-Mar-2023**	27-Aug-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
SW20, SW36, SW43	**28-Feb-2023**	**14-Mar-2023**	27-Aug-2023	✓	**16-Mar-2023**	27-Aug-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**14-Mar-2023**	29-Mar-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**14-Mar-2023**	30-Mar-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**14-Mar-2023**	31-Mar-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**14-Mar-2023**	01-Apr-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**14-Mar-2023**	03-Apr-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**14-Mar-2023**	04-Apr-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**14-Mar-2023**	05-Apr-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**14-Mar-2023**	27-Mar-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**14-Mar-2023**	28-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**18-Mar-2023**	29-Mar-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**18-Mar-2023**	30-Mar-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**18-Mar-2023**	31-Mar-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**18-Mar-2023**	01-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**18-Mar-2023**	03-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**18-Mar-2023**	04-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**18-Mar-2023**	05-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**18-Mar-2023**	27-Mar-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**18-Mar-2023**	28-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**15-Mar-2023**	03-Mar-2023	×
Clear Plastic Bottle - Natural (EK057G)							
MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**15-Mar-2023**	04-Mar-2023	×
Clear Plastic Bottle - Natural (EK057G)							
MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**15-Mar-2023**	05-Mar-2023	×
Clear Plastic Bottle - Natural (EK057G)							
L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**15-Mar-2023**	06-Mar-2023	×
Clear Plastic Bottle - Natural (EK057G)							
MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**15-Mar-2023**	08-Mar-2023	×
Clear Plastic Bottle - Natural (EK057G)							
SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**15-Mar-2023**	09-Mar-2023	×
Clear Plastic Bottle - Natural (EK057G)							
L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**15-Mar-2023**	10-Mar-2023	×
Clear Plastic Bottle - Natural (EK057G)							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**15-Mar-2023**	01-Mar-2023	×
Clear Plastic Bottle - Natural (EK057G)							
SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**15-Mar-2023**	02-Mar-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**18-Mar-2023**	29-Mar-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**18-Mar-2023**	30-Mar-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**18-Mar-2023**	31-Mar-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**18-Mar-2023**	01-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**18-Mar-2023**	03-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**18-Mar-2023**	04-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**18-Mar-2023**	05-Apr-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**18-Mar-2023**	27-Mar-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**18-Mar-2023**	28-Mar-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) RN13030692, RN13030698, MW77, MW40, BD01_2902	**01-Mar-2023**	**----**	----	----	**15-Mar-2023**	03-Mar-2023	×
Clear Plastic Bottle - Natural (EK071G) MW1, MW74, ESC3, MW11, MW72, MW73, MW79, MW80, BD02_0203	**02-Mar-2023**	**----**	----	----	**15-Mar-2023**	04-Mar-2023	×
Clear Plastic Bottle - Natural (EK071G) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49, BD03_0303	**03-Mar-2023**	**----**	----	----	**15-Mar-2023**	05-Mar-2023	×
Clear Plastic Bottle - Natural (EK071G) L006-B05, MW31, MW32	**04-Mar-2023**	**----**	----	----	**15-Mar-2023**	06-Mar-2023	×
Clear Plastic Bottle - Natural (EK071G) MW23, MW66, RN13030697, SW41, RN13030126, L021-B01	**06-Mar-2023**	**----**	----	----	**15-Mar-2023**	08-Mar-2023	×
Clear Plastic Bottle - Natural (EK071G) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, BD04_0703	**07-Mar-2023**	**----**	----	----	**15-Mar-2023**	09-Mar-2023	×
Clear Plastic Bottle - Natural (EK071G) L012-B01, BD04_0803	**08-Mar-2023**	**----**	----	----	**15-Mar-2023**	10-Mar-2023	×
Clear Plastic Bottle - Natural (EK071G) PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**----**	----	----	**15-Mar-2023**	01-Mar-2023	×
Clear Plastic Bottle - Natural (EK071G) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**----**	----	----	**15-Mar-2023**	02-Mar-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) RN13030692, RN13030698, MW77, MW40	**01-Mar-2023**	**13-Mar-2023**	28-Aug-2023	✓	**14-Mar-2023**	28-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0103, BD01_2902	**01-Mar-2023**	**16-Mar-2023**	28-Aug-2023	✓	**17-Mar-2023**	28-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW1, MW74, ESC3, MW11	**02-Mar-2023**	**13-Mar-2023**	29-Aug-2023	✓	**14-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW72, MW73, MW79, MW80	**02-Mar-2023**	**14-Mar-2023**	29-Aug-2023	✓	**15-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB01_0203, BD02_0203	**02-Mar-2023**	**16-Mar-2023**	29-Aug-2023	✓	**17-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD03_0303	**03-Mar-2023**	**13-Mar-2023**	30-Aug-2023	✓	**14-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49	**03-Mar-2023**	**14-Mar-2023**	30-Aug-2023	✓	**15-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0303, RB01_0303	**03-Mar-2023**	**16-Mar-2023**	30-Aug-2023	✓	**17-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW31, MW32	**04-Mar-2023**	**14-Mar-2023**	31-Aug-2023	✓	**15-Mar-2023**	31-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0403, RB01_0403	**04-Mar-2023**	**16-Mar-2023**	31-Aug-2023	✓	**17-Mar-2023**	31-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW23, MW66, RN13030697, SW41	**06-Mar-2023**	**14-Mar-2023**	02-Sep-2023	✓	**15-Mar-2023**	02-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) RN13030126, L021-B01	**06-Mar-2023**	**16-Mar-2023**	02-Sep-2023	✓	**17-Mar-2023**	02-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_0703	**07-Mar-2023**	**13-Mar-2023**	03-Sep-2023	✓	**14-Mar-2023**	03-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, FB01_0703, RB01_0703	**07-Mar-2023**	**16-Mar-2023**	03-Sep-2023	✓	**17-Mar-2023**	03-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_0803	**08-Mar-2023**	**13-Mar-2023**	04-Sep-2023	✓	**14-Mar-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) L012-B01	**08-Mar-2023**	**16-Mar-2023**	04-Sep-2023	✓	**17-Mar-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids - Continued							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**13-Mar-2023**	26-Aug-2023	✓	**14-Mar-2023**	26-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**13-Mar-2023**	27-Aug-2023	✓	**14-Mar-2023**	27-Aug-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) RN13030692, RN13030698, MW77, MW40	**01-Mar-2023**	**13-Mar-2023**	28-Aug-2023	✓	**14-Mar-2023**	28-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0103, BD01_2902	**01-Mar-2023**	**16-Mar-2023**	28-Aug-2023	✓	**17-Mar-2023**	28-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW1, MW74, ESC3, MW11	**02-Mar-2023**	**13-Mar-2023**	29-Aug-2023	✓	**14-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW72, MW73, MW79, MW80	**02-Mar-2023**	**14-Mar-2023**	29-Aug-2023	✓	**15-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB01_0203, BD02_0203	**02-Mar-2023**	**16-Mar-2023**	29-Aug-2023	✓	**17-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD03_0303	**03-Mar-2023**	**13-Mar-2023**	30-Aug-2023	✓	**14-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49	**03-Mar-2023**	**14-Mar-2023**	30-Aug-2023	✓	**15-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0303, RB01_0303	**03-Mar-2023**	**16-Mar-2023**	30-Aug-2023	✓	**17-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW31, MW32	**04-Mar-2023**	**14-Mar-2023**	31-Aug-2023	✓	**15-Mar-2023**	31-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0403, RB01_0403	**04-Mar-2023**	**16-Mar-2023**	31-Aug-2023	✓	**17-Mar-2023**	31-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW23, MW66, RN13030697, SW41	**06-Mar-2023**	**14-Mar-2023**	02-Sep-2023	✓	**15-Mar-2023**	02-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) RN13030126, L021-B01	**06-Mar-2023**	**16-Mar-2023**	02-Sep-2023	✓	**17-Mar-2023**	02-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_0703	**07-Mar-2023**	**13-Mar-2023**	03-Sep-2023	✓	**14-Mar-2023**	03-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, FB01_0703, RB01_0703	**07-Mar-2023**	**16-Mar-2023**	03-Sep-2023	✓	**17-Mar-2023**	03-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_0803	**08-Mar-2023**	**13-Mar-2023**	04-Sep-2023	✓	**14-Mar-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) L012-B01	**08-Mar-2023**	**16-Mar-2023**	04-Sep-2023	✓	**17-Mar-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids - Continued							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**13-Mar-2023**	26-Aug-2023	✓	**14-Mar-2023**	26-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**13-Mar-2023**	27-Aug-2023	✓	**14-Mar-2023**	27-Aug-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) RN13030692, RN13030698, MW77, MW40	**01-Mar-2023**	**13-Mar-2023**	28-Aug-2023	✓	**14-Mar-2023**	28-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0103, BD01_2902	**01-Mar-2023**	**16-Mar-2023**	28-Aug-2023	✓	**17-Mar-2023**	28-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW1, MW74, ESC3, MW11	**02-Mar-2023**	**13-Mar-2023**	29-Aug-2023	✓	**14-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW72, MW73, MW79, MW80	**02-Mar-2023**	**14-Mar-2023**	29-Aug-2023	✓	**15-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB01_0203, BD02_0203	**02-Mar-2023**	**16-Mar-2023**	29-Aug-2023	✓	**17-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD03_0303	**03-Mar-2023**	**13-Mar-2023**	30-Aug-2023	✓	**14-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49	**03-Mar-2023**	**14-Mar-2023**	30-Aug-2023	✓	**15-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0303, RB01_0303	**03-Mar-2023**	**16-Mar-2023**	30-Aug-2023	✓	**17-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW31, MW32	**04-Mar-2023**	**14-Mar-2023**	31-Aug-2023	✓	**15-Mar-2023**	31-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0403, RB01_0403	**04-Mar-2023**	**16-Mar-2023**	31-Aug-2023	✓	**17-Mar-2023**	31-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW23, MW66, RN13030697, SW41	**06-Mar-2023**	**14-Mar-2023**	02-Sep-2023	✓	**15-Mar-2023**	02-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) RN13030126, L021-B01	**06-Mar-2023**	**16-Mar-2023**	02-Sep-2023	✓	**17-Mar-2023**	02-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_0703	**07-Mar-2023**	**13-Mar-2023**	03-Sep-2023	✓	**14-Mar-2023**	03-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, FB01_0703, RB01_0703	**07-Mar-2023**	**16-Mar-2023**	03-Sep-2023	✓	**17-Mar-2023**	03-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_0803	**08-Mar-2023**	**13-Mar-2023**	04-Sep-2023	✓	**14-Mar-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) L012-B01	**08-Mar-2023**	**16-Mar-2023**	04-Sep-2023	✓	**17-Mar-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides - Continued							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**13-Mar-2023**	26-Aug-2023	✓	**14-Mar-2023**	26-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**13-Mar-2023**	27-Aug-2023	✓	**14-Mar-2023**	27-Aug-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) RN13030692, RN13030698, MW77, MW40	**01-Mar-2023**	**13-Mar-2023**	28-Aug-2023	✓	**14-Mar-2023**	28-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0103, BD01_2902	**01-Mar-2023**	**16-Mar-2023**	28-Aug-2023	✓	**17-Mar-2023**	28-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW1, MW74, ESC3, MW11	**02-Mar-2023**	**13-Mar-2023**	29-Aug-2023	✓	**14-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW72, MW73, MW79, MW80	**02-Mar-2023**	**14-Mar-2023**	29-Aug-2023	✓	**15-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB01_0203, BD02_0203	**02-Mar-2023**	**16-Mar-2023**	29-Aug-2023	✓	**17-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD03_0303	**03-Mar-2023**	**13-Mar-2023**	30-Aug-2023	✓	**14-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49	**03-Mar-2023**	**14-Mar-2023**	30-Aug-2023	✓	**15-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0303, RB01_0303	**03-Mar-2023**	**16-Mar-2023**	30-Aug-2023	✓	**17-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW31, MW32	**04-Mar-2023**	**14-Mar-2023**	31-Aug-2023	✓	**15-Mar-2023**	31-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0403, RB01_0403	**04-Mar-2023**	**16-Mar-2023**	31-Aug-2023	✓	**17-Mar-2023**	31-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW23, MW66, RN13030697, SW41	**06-Mar-2023**	**14-Mar-2023**	02-Sep-2023	✓	**15-Mar-2023**	02-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) RN13030126, L021-B01	**06-Mar-2023**	**16-Mar-2023**	02-Sep-2023	✓	**17-Mar-2023**	02-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_0703	**07-Mar-2023**	**13-Mar-2023**	03-Sep-2023	✓	**14-Mar-2023**	03-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, FB01_0703, RB01_0703	**07-Mar-2023**	**16-Mar-2023**	03-Sep-2023	✓	**17-Mar-2023**	03-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_0803	**08-Mar-2023**	**13-Mar-2023**	04-Sep-2023	✓	**14-Mar-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) L012-B01	**08-Mar-2023**	**16-Mar-2023**	04-Sep-2023	✓	**17-Mar-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**13-Mar-2023**	26-Aug-2023	✓	**14-Mar-2023**	26-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT)							
SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**13-Mar-2023**	27-Aug-2023	✓	**14-Mar-2023**	27-Aug-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) RN13030692, RN13030698, MW77, MW40	**01-Mar-2023**	**13-Mar-2023**	28-Aug-2023	✓	**14-Mar-2023**	28-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0103, BD01_2902	**01-Mar-2023**	**16-Mar-2023**	28-Aug-2023	✓	**17-Mar-2023**	28-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW1, MW74, ESC3, MW11	**02-Mar-2023**	**13-Mar-2023**	29-Aug-2023	✓	**14-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW72, MW73, MW79, MW80	**02-Mar-2023**	**14-Mar-2023**	29-Aug-2023	✓	**15-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB01_0203, BD02_0203	**02-Mar-2023**	**16-Mar-2023**	29-Aug-2023	✓	**17-Mar-2023**	29-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD03_0303	**03-Mar-2023**	**13-Mar-2023**	30-Aug-2023	✓	**14-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW43, MW68, ESC4, MW75, MW76, MW78, MW9, MW49	**03-Mar-2023**	**14-Mar-2023**	30-Aug-2023	✓	**15-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0303, RB01_0303	**03-Mar-2023**	**16-Mar-2023**	30-Aug-2023	✓	**17-Mar-2023**	30-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW31, MW32	**04-Mar-2023**	**14-Mar-2023**	31-Aug-2023	✓	**15-Mar-2023**	31-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0403, RB01_0403	**04-Mar-2023**	**16-Mar-2023**	31-Aug-2023	✓	**17-Mar-2023**	31-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW23, MW66, RN13030697, SW41	**06-Mar-2023**	**14-Mar-2023**	02-Sep-2023	✓	**15-Mar-2023**	02-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) RN13030126, L021-B01	**06-Mar-2023**	**16-Mar-2023**	02-Sep-2023	✓	**17-Mar-2023**	02-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_0703	**07-Mar-2023**	**13-Mar-2023**	03-Sep-2023	✓	**14-Mar-2023**	03-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) SW22, MW69, RN13030127, L005-B01, RN13030715, MW70, FB01_0703, RB01_0703	**07-Mar-2023**	**16-Mar-2023**	03-Sep-2023	✓	**17-Mar-2023**	03-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_0803	**08-Mar-2023**	**13-Mar-2023**	04-Sep-2023	✓	**14-Mar-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT) L012-B01	**08-Mar-2023**	**16-Mar-2023**	04-Sep-2023	✓	**17-Mar-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP231X-SUT)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums - Continued							
PW2, Notch-V1, SW13, Notch-V2	**27-Feb-2023**	**13-Mar-2023**	26-Aug-2023	✓	**14-Mar-2023**	26-Aug-2023	✓
HDPE (no PTFE) (EP231X-SUT)							
SW20, SW36, SW12, SW2, DRD, PW1, SW43	**28-Feb-2023**	**13-Mar-2023**	27-Aug-2023	✓	**14-Mar-2023**	27-Aug-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	8	80	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	4	63	**6.35**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	0	51	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	0	52	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	10	82	**12.20**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	80	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	4	63	**6.35**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	1	**300.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	6	51	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	9	52	**17.31**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	5	82	**6.10**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Conductivity by Auto Titrator	EA010-P	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	80	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	4	63	**6.35**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	3	51	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	5	82	**6.10**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	2	63	**3.17**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	5	82	**6.10**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Suspended Solids (Low Level)	EA025LL	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . Extra volume is used to counter the effect from saline water. This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.

Analytical Methods	Method	Matrix	Method Descriptions
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2306934**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: k.hiltonbarber@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BC200153.02	Page	: 1 of 10
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: CALLIDE QUARTERLY MONITORING		
Sampler	: DANIEL PAPINCZAK		

Dates

Date Samples Received	: 10-Mar-2023 11:15	Issue Date	: 10-Mar-2023
Client Requested Due Date	: 20-Mar-2023	Scheduled Reporting Date	: **20-Mar-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 8	Temperature	: 8.2<->11.4°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 60 / 60

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please be advised, one of the green unpreserved containers for sample "RN13030697" was received empty at the laboratory. Low level TSS analysis cannot be assigned to this samples due to insufficient volume. Standard TSS analysis has been assigned instead.**
- **Please be advised, containers for sample "SD04_0803" were not submitted. Containers labelled as "SD05_0803" have been submitted instead. If you wish to discuss this further please contact ALS Brisbane Client Services Department at ALSEnviro.Brisbane@alsglobal.com or phone 3243 7222.**
- ***Samples were originally received by ALS Gladstone on 09/03/2023, and forwarded to ALS Brisbane for analysis.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **Samples "SD01_2902", "SD02_0203", "SD04_0703" and "SD05_0803" have been forwarded to Eurofins, as requested. Please note that this will incur a freight forwarding fee.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025LL Suspended Solids - Low Level	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK071G Reactive Phosphorus by Discrete analyser	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
EB2306934-001	27-Feb-2023 00:00	PW2	✓	✓	✓	✓	✓	✓	✓
EB2306934-002	27-Feb-2023 00:00	Notch-V1	✓	✓	✓	✓	✓	✓	✓
EB2306934-003	27-Feb-2023 00:00	SW13	✓	✓	✓	✓	✓	✓	✓
EB2306934-004	27-Feb-2023 00:00	Notch-V2	✓	✓	✓	✓	✓	✓	✓
EB2306934-005	28-Feb-2023 00:00	SW20	✓	✓	✓	✓	✓	✓	✓
EB2306934-006	28-Feb-2023 00:00	SW36	✓	✓	✓	✓	✓	✓	✓
EB2306934-007	28-Feb-2023 00:00	SW12	✓	✓	✓	✓	✓	✓	✓
EB2306934-008	28-Feb-2023 00:00	SW2	✓	✓	✓	✓	✓	✓	✓
EB2306934-009	28-Feb-2023 00:00	DRD	✓	✓	✓	✓	✓	✓	✓
EB2306934-010	28-Feb-2023 00:00	PW1	✓	✓	✓	✓	✓	✓	✓
EB2306934-011	28-Feb-2023 00:00	SW43	✓	✓	✓	✓	✓	✓	✓
EB2306934-012	01-Mar-2023 00:00	RN13030692	✓	✓	✓	✓	✓	✓	✓
EB2306934-013	01-Mar-2023 00:00	RN13030698	✓	✓	✓	✓	✓	✓	✓
EB2306934-014	01-Mar-2023 00:00	MW77	✓	✓	✓	✓	✓	✓	✓
EB2306934-015	01-Mar-2023 00:00	MW40	✓	✓	✓	✓	✓	✓	✓
EB2306934-016	02-Mar-2023 00:00	MW1	✓	✓	✓	✓	✓	✓	✓
EB2306934-017	02-Mar-2023 00:00	MW74	✓	✓	✓	✓	✓	✓	✓
EB2306934-018	02-Mar-2023 00:00	ESC3	✓	✓	✓	✓	✓	✓	✓
EB2306934-019	02-Mar-2023 00:00	MW11	✓	✓	✓	✓	✓	✓	✓
EB2306934-020	02-Mar-2023 00:00	MW72	✓	✓	✓	✓	✓	✓	✓
EB2306934-021	02-Mar-2023 00:00	MW73	✓	✓	✓	✓	✓	✓	✓
EB2306934-022	02-Mar-2023 00:00	MW79	✓	✓	✓	✓	✓	✓	✓
EB2306934-023	02-Mar-2023 00:00	MW80	✓	✓	✓	✓	✓	✓	✓
EB2306934-024	03-Mar-2023 00:00	MW43	✓	✓	✓	✓	✓	✓	✓
EB2306934-025	03-Mar-2023 00:00	MW68	✓	✓	✓	✓	✓	✓	✓
EB2306934-026	03-Mar-2023 00:00	ESC4	✓	✓	✓	✓	✓	✓	✓
EB2306934-027	03-Mar-2023 00:00	MW75	✓	✓	✓	✓	✓	✓	✓
EB2306934-028	03-Mar-2023 00:00	MW76	✓	✓	✓	✓	✓	✓	✓
EB2306934-029	03-Mar-2023 00:00	MW78	✓	✓	✓	✓	✓	✓	✓
EB2306934-030	03-Mar-2023 00:00	MW9	✓	✓	✓	✓	✓	✓	✓
EB2306934-031	03-Mar-2023 00:00	MW49	✓	✓	✓	✓	✓	✓	✓
EB2306934-032	04-Mar-2023 00:00	L006-B05	✓	✓	✓	✓	✓	✓	✓
EB2306934-033	04-Mar-2023 00:00	MW31	✓	✓	✓	✓	✓	✓	✓
EB2306934-034	04-Mar-2023 00:00	MW32	✓	✓	✓	✓	✓	✓	✓
EB2306934-035	06-Mar-2023 00:00	MW23	✓	✓	✓	✓	✓	✓	✓

			WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025LL Suspended Solids - Low Level	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK071G Reactive Phosphorus by Discrete analyser	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
EB2306934-036	06-Mar-2023 00:00	MW66	✓	✓	✓	✓	✓	✓	✓
EB2306934-037	06-Mar-2023 00:00	RN13030697	✓	✓	✓		✓	✓	✓
EB2306934-038	06-Mar-2023 00:00	SW41	✓	✓	✓	✓	✓	✓	✓
EB2306934-039	06-Mar-2023 00:00	RN13030126	✓	✓	✓	✓	✓	✓	✓
EB2306934-040	06-Mar-2023 00:00	L021-B01	✓	✓	✓	✓	✓	✓	✓
EB2306934-041	07-Mar-2023 00:00	SW22	✓	✓	✓	✓	✓	✓	✓
EB2306934-042	07-Mar-2023 00:00	MW69	✓	✓	✓	✓	✓	✓	✓
EB2306934-043	07-Mar-2023 00:00	RN13030127	✓	✓	✓	✓	✓	✓	✓
EB2306934-044	07-Mar-2023 00:00	L005-B01	✓	✓	✓	✓	✓	✓	✓
EB2306934-045	07-Mar-2023 00:00	RN13030715	✓	✓	✓	✓	✓	✓	✓
EB2306934-046	07-Mar-2023 00:00	MW70	✓	✓	✓	✓	✓	✓	✓
EB2306934-047	08-Mar-2023 00:00	L012-B01	✓	✓	✓	✓	✓	✓	✓
EB2306934-056	01-Mar-2023 00:00	BD01_2902	✓	✓	✓	✓	✓	✓	✓
EB2306934-057	02-Mar-2023 00:00	BD02_0203	✓	✓	✓	✓	✓	✓	✓
EB2306934-058	03-Mar-2023 00:00	BD03_0303	✓	✓	✓	✓	✓	✓	✓
EB2306934-059	07-Mar-2023 00:00	BD04_0703	✓	✓	✓	✓	✓	✓	✓
EB2306934-060	08-Mar-2023 00:00	BD04_0803	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-04 Nitrite and Nitrate
EB2306934-001	27-Feb-2023 00:00	PW2		✓	✓	✓
EB2306934-002	27-Feb-2023 00:00	Notch-V1		✓	✓	✓
EB2306934-003	27-Feb-2023 00:00	SW13		✓	✓	✓
EB2306934-004	27-Feb-2023 00:00	Notch-V2		✓	✓	✓
EB2306934-005	28-Feb-2023 00:00	SW20		✓	✓	✓
EB2306934-006	28-Feb-2023 00:00	SW36		✓	✓	✓
EB2306934-007	28-Feb-2023 00:00	SW12		✓	✓	✓
EB2306934-008	28-Feb-2023 00:00	SW2		✓	✓	✓
EB2306934-009	28-Feb-2023 00:00	DRD		✓	✓	✓
EB2306934-010	28-Feb-2023 00:00	PW1		✓	✓	✓
EB2306934-011	28-Feb-2023 00:00	SW43		✓	✓	✓
EB2306934-012	01-Mar-2023 00:00	RN13030692		✓	✓	✓
EB2306934-013	01-Mar-2023 00:00	RN13030698		✓	✓	✓

			WATER - EA025H Suspended Solids - Standard Level	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-04 Nitrite and Nitrate
EB2306934-014	01-Mar-2023 00:00	MW77		✓	✓	✓
EB2306934-015	01-Mar-2023 00:00	MW40		✓	✓	✓
EB2306934-016	02-Mar-2023 00:00	MW1		✓	✓	✓
EB2306934-017	02-Mar-2023 00:00	MW74		✓	✓	✓
EB2306934-018	02-Mar-2023 00:00	ESC3		✓	✓	✓
EB2306934-019	02-Mar-2023 00:00	MW11		✓	✓	✓
EB2306934-020	02-Mar-2023 00:00	MW72		✓	✓	✓
EB2306934-021	02-Mar-2023 00:00	MW73		✓	✓	✓
EB2306934-022	02-Mar-2023 00:00	MW79		✓	✓	✓
EB2306934-023	02-Mar-2023 00:00	MW80		✓	✓	✓
EB2306934-024	03-Mar-2023 00:00	MW43		✓	✓	✓
EB2306934-025	03-Mar-2023 00:00	MW68		✓	✓	✓
EB2306934-026	03-Mar-2023 00:00	ESC4		✓	✓	✓
EB2306934-027	03-Mar-2023 00:00	MW75		✓	✓	✓
EB2306934-028	03-Mar-2023 00:00	MW76		✓	✓	✓
EB2306934-029	03-Mar-2023 00:00	MW78		✓	✓	✓
EB2306934-030	03-Mar-2023 00:00	MW9		✓	✓	✓
EB2306934-031	03-Mar-2023 00:00	MW49		✓	✓	✓
EB2306934-032	04-Mar-2023 00:00	L006-B05		✓	✓	✓
EB2306934-033	04-Mar-2023 00:00	MW31		✓	✓	✓
EB2306934-034	04-Mar-2023 00:00	MW32		✓	✓	✓
EB2306934-035	06-Mar-2023 00:00	MW23		✓	✓	✓
EB2306934-036	06-Mar-2023 00:00	MW66		✓	✓	✓
EB2306934-037	06-Mar-2023 00:00	RN13030697	✓	✓	✓	✓
EB2306934-038	06-Mar-2023 00:00	SW41		✓	✓	✓
EB2306934-039	06-Mar-2023 00:00	RN13030126		✓	✓	✓
EB2306934-040	06-Mar-2023 00:00	L021-B01		✓	✓	✓
EB2306934-041	07-Mar-2023 00:00	SW22		✓	✓	✓
EB2306934-042	07-Mar-2023 00:00	MW69		✓	✓	✓
EB2306934-043	07-Mar-2023 00:00	RN13030127		✓	✓	✓
EB2306934-044	07-Mar-2023 00:00	L005-B01		✓	✓	✓
EB2306934-045	07-Mar-2023 00:00	RN13030715		✓	✓	✓
EB2306934-046	07-Mar-2023 00:00	MW70		✓	✓	✓
EB2306934-047	08-Mar-2023 00:00	L012-B01		✓	✓	✓
EB2306934-048	01-Mar-2023 00:00	FB01_0103			✓	
EB2306934-049	03-Mar-2023 00:00	FB01_0303			✓	
EB2306934-050	04-Mar-2023 00:00	FB01_0403			✓	
EB2306934-051	07-Mar-2023 00:00	FB01_0703			✓	
EB2306934-052	02-Mar-2023 00:00	RB01_0203			✓	
EB2306934-053	03-Mar-2023 00:00	RB01_0303			✓	
EB2306934-054	04-Mar-2023 00:00	RB01_0403			✓	

			WATER - EA025H Suspended Solids - Standard Level	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-04 Nitrite and Nitrate
EB2306934-055	07-Mar-2023 00:00	RB01_0703			✓	
EB2306934-056	01-Mar-2023 00:00	BD01_2902		✓	✓	✓
EB2306934-057	02-Mar-2023 00:00	BD02_0203		✓	✓	✓
EB2306934-058	03-Mar-2023 00:00	BD03_0303		✓	✓	✓
EB2306934-059	07-Mar-2023 00:00	BD04_0703		✓	✓	✓
EB2306934-060	08-Mar-2023 00:00	BD04_0803		✓	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA005-P: pH by Auto Titrator							
BD01_2902	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	×	----	----
BD02_0203	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	×	----	----
BD03_0303	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	×	----	----
BD04_0703	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	×	----	----
BD04_0803	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	×	----	----
DRD	Clear Plastic Bottle - Natural	----	28-Feb-2023	10-Mar-2023	×	----	----
ESC3	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	×	----	----
ESC4	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	×	----	----
L005-B01	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	×	----	----
L006-B05	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	×	----	----
L012-B01	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	×	----	----
L021-B01	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	×	----	----
MW11	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	×	----	----
MW1	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	×	----	----
MW23	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	×	----	----
MW31	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	×	----	----
MW32	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	×	----	----
MW40	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	×	----	----
MW43	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	×	----	----
MW49	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	×	----	----
MW66	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	×	----	----
MW68	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	×	----	----
MW69	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	×	----	----
MW70	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	×	----	----
MW72	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	×	----	----
MW73	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	×	----	----
MW74	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	×	----	----
MW75	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	×	----	----
MW76	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	×	----	----
MW77	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	×	----	----
MW78	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	×	----	----
MW79	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	×	----	----
MW80	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	×	----	----
MW9	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	×	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	27-Feb-2023	10-Mar-2023	×	----	----

Notch-V2	Clear Plastic Bottle - Natural	----	27-Feb-2023	10-Mar-2023	✘	----	----
PW1	Clear Plastic Bottle - Natural	----	28-Feb-2023	10-Mar-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	27-Feb-2023	10-Mar-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
RN13030127	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	28-Feb-2023	10-Mar-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	27-Feb-2023	10-Mar-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	28-Feb-2023	10-Mar-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW2	Clear Plastic Bottle - Natural	----	28-Feb-2023	10-Mar-2023	✘	----	----
SW36	Clear Plastic Bottle - Natural	----	28-Feb-2023	10-Mar-2023	✘	----	----
SW41	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
SW43	Clear Plastic Bottle - Natural	----	28-Feb-2023	10-Mar-2023	✘	----	----
EA015H: Total Dissolved Solids (High Level)							
BD01_2902	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
BD02_0203	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
ESC3	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW11	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW1	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW77	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW79	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
PW1	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW2	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW36	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW43	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
EA025LL: Suspended Solids (Low Level)							
BD01_2902	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
BD02_0203	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
ESC3	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW11	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW1	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW77	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW79	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
PW1	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----

SW2	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW36	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW43	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
ED093F: Major Cations - Dissolved							
BD01_2902	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
BD02_0203	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
ESC3	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW11	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW1	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW77	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW79	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
PW1	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW2	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW36	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
SW43	Clear Plastic Bottle - Natural	----	07-Mar-2023	10-Mar-2023	✘	----	----
EK057G: Nitrite as N by Discrete Analyser							
BD01_2902	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	✘	----	----
BD02_0203	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
BD03_0303	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
BD04_0703	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
ESC3	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
ESC4	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
L005-B01	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
L006-B05	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
L021-B01	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW11	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW1	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW23	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW31	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
MW32	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	✘	----	----
MW43	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW49	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW66	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW68	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW69	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW70	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW75	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW76	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW77	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	✘	----	----
MW78	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW79	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW9	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	✘	----	----
PW1	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	✘	----	----

RN13030126	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
RN13030127	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
SW2	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
SW36	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
SW41	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
SW43	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
EK071G: Reactive Phosphorus as P-By Discrete Analyser							
BD01_2902	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	✘	----	----
BD02_0203	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
BD03_0303	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
BD04_0703	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
ESC3	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
ESC4	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
L005-B01	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
L006-B05	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
L021-B01	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW11	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW1	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW23	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW31	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
MW32	Clear Plastic Bottle - Natural	----	06-Mar-2023	10-Mar-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	✘	----	----
MW43	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW49	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW66	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
MW68	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW69	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW70	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW75	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW76	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW77	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	✘	----	----
MW78	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
MW79	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	04-Mar-2023	10-Mar-2023	✘	----	----
MW9	Clear Plastic Bottle - Natural	----	05-Mar-2023	10-Mar-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	✘	----	----
PW1	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
RN13030127	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	03-Mar-2023	10-Mar-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	01-Mar-2023	10-Mar-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	09-Mar-2023	10-Mar-2023	✘	----	----
SW2	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
SW36	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----
SW41	Clear Plastic Bottle - Natural	----	08-Mar-2023	10-Mar-2023	✘	----	----
SW43	Clear Plastic Bottle - Natural	----	02-Mar-2023	10-Mar-2023	✘	----	----

Requested Deliverables

CS ENERGY ENVIRONMENTAL DATA

- *AU Certificate of Analysis - NATA (COA)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	CSEnergyEnvironmentData@csenergy.com.au
- Chain of Custody (CoC) (COC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ESDAT (ESDAT)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - XTab (XTAB)	Email	CSEnergyEnvironmentData@csenergy.com.au

ESDAT REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au
- EDI Format - XTab (XTAB)	Email	epicenvironmental@esdat.com.au

INVOICES

- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au

INVOICES & RESULTS

- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	labs@epicenvironmental.com.au

LUKE AMIES

- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au

MICHAEL KOWALCZYK

- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

epic

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE QUARTERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	1 of 3
Number of Eskies:	7

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

Please Split Reports:		SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS
1	AA	PW2	27/02/2023	Water	x	x	x	x	
2	AA	Notch-V1	27/02/2023	Water	x	x	x	x	
3	AA	SW13	27/02/2023	Water	x	x	x	x	
4	AA	Notch-V2	27/02/2023	Water	x	x	x	x	
5	AA	SW20	28/02/2023	Water	x	x	x	x	
6	AA	SW36	28/02/2023	Water	x	x	x	x	
7	AA	SW12	28/02/2023	Water	x	x	x	x	
8	AA	SW2	28/02/2023	Water	x	x	x	x	
9	AA	DRD	28/02/2023	Water	x	x	x	x	
10	AA	PW1	28/02/2023	Water	x	x	x	x	
11	AA	SW43	28/02/2023	Water	x	x	x	x	
12	AA	RN13030692	1/3/2023	Water	x	x	x	x	
13	AA	RN13030698	1/3/2023	Water	x	x	x	x	
14	AA	MW77	1/3/2023	Water	x	x	x	x	
15	AA	MW40	1/3/2023	Water	x	x	x	x	
16	AA	MW1	2/3/2023	Water	x	x	x	x	
17	AA	MW74	2/3/2023	Water	x	x	x	x	
18	AA	ESC3	2/3/2023	Water	x	x	x	x	
19	AA	MW11	2/3/2023	Water	x	x	x	x	
20	AA	MW72	2/3/2023	Water	x	x	x	x	
21	AA	MW73	2/3/2023	Water	x	x	x	x	
22	AA	MW79	2/3/2023	Water	x	x	x	x	
23	AA	MW80	2/3/2023	Water	x	x	x	x	
24	AA	MW43	3/3/2023	Water	x	x	x	x	
25	AA	MW68	3/3/2023	Water	x	x	x	x	
26	AA	ESC4	3/3/2023	Water	x	x	x	x	
27	AA	MW75	3/3/2023	Water	x	x	x	x	
28	AA	MW76	3/3/2023	Water	x	x	x	x	
29	AA	MW78	3/3/2023	Water	x	x	x	x	
30	AA	MW9	3/3/2023	Water	x	x	x	x	
31	AA	MW49	3/3/2023	Water	x	x	x	x	

SP 10/3/23 1115

Potable Water								Bore Water															SOIL	
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	PFAS (EP231X)	HOLD
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			

HT

Environmental Division
Brisbane
Work Order Reference
EB2306934

Telephone : - 61-7-3243 7222

193

epic

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE QUARTERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	1 of 3
Number of Eskies:	7

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

Please Split Reports:		SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025L)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	PFAS (EP233X)	HOLD
32	AC	L006-B05	4/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
33	AA	MW31	4/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
34	AA	MW32	4/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
35	AA	MW23	6/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
36	AA	MW66	6/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
37	AA	RN13030697	6/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
38	AA	SW41	6/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
39	AA	RN13030126	6/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
40	AE	L021-B01	6/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
41	AA	SW22	7/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
42	AA	MW69	7/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
43	AA	RN13030127	7/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
44	AB	L005-B01	7/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
45	AA	RN13030715	7/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
46	AA	MW70	7/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
47	AD	L012-B01	8/3/2023	Water	x	x	x	x									x	x	x	x	x	x	x	x	x	x	x			
48	AA	FB01_0103	1/3/2023 0:00	Water				x																			x			
49	AA	FB01_0303	3/3/2023 0:00	Water				x																			x			
50	AA	FB01_0403	4/3/2023 0:00	Water				x																			x			
51	AA	FB01_0703	7/3/2023 0:00	Water				x																			x			
52	AA	RB01_0203	2/3/2023 0:00	Water				x																			x			
53	AA	RB01_0303	3/3/2023 0:00	Water				x																			x			
54	AA	RB01_0403	4/3/2023 0:00	Water				x																			x			
55	AA	RB01_0703	7/3/2023 0:00	Water				x																			x			
					10	10	10	15									23	23	23	23	23	23	23	23	23	23	27			

Relinquished By:	Dan Papinczak	0407 611 133	08-Mar-23
Received By	SIGNATURE		DATE

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

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email CSEnergyEnvironmentData@csenergy.com.au

SP 10/3/23 1115

2 of 3

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Chain of Custody Record

Project No:	BC200153.03	Lab:	ALS
Project/Site:	CALLIDE QUATERLY MONITORING	Lab Quote No:	BN/344/21-V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)	Date Results Required:	5 day TAT
Phone:	0439 115 598	Sample Disposal After:	
Page:	2 of 3		
Number of Eskies:	7		

Please Split Reports:	SAMPLE ID	DATE	MATRIX	50ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS
56	BD01_2902	1/3/2023	Water	x	x	x	x	
57	BD02_0203	2/3/2023	Water	x	x	x	x	
58	BD03_0303	3/3/2023	Water	x	x	x	x	
59	BD04_0703	7/3/2023	Water	x	x	x	x	
60	BD04_0803	8/3/2023	Water	x	x	x	x	

Potable Water							
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	

| Bore Water | | | | | | |

epic environmental

Chain of Custody Record

Project No:	BC200153.03	Lab:	Send to Eurofins
Project/Site:	CALLIDE QUARTERY MONITORING	Lab Quote No:	BN/344/21-V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)	Date Results Required:	5 day TAT
Phone:	0439 115 598	Sample Disposal After:	
Page:	3 of 3		
Number of Eskies:	1		

Please Split Reports:	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS
	SD01_2902	1/3/2023	Water	x	x	x	x	
	SD02_0203	2/3/2023	Water	x	x	x	x	
	SD03_0303	3/3/2023	Water	x	x	x	x	
	SD04_0703	7/3/2023	Water	x	x	x	x	
	SD04_0803	8/3/2023	Water	x	x	x	x	

Potable Water							Bore Water												SOIL	
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	PFAS (EP231X)	HOLD
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			

Relinquished By: Dan Papinczak	Dan Papinczak	Received By	
0407 611 133	08-Mar-23	SIGNATURE	DATE

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES: Please report with CS Energy EDD format; ENVNC_V4

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email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

13/3/23

Date/Time: 13/3/23 2:35pm
Chilled: Yes / No
Temp: 7.0
-1.5
Correction: 5.5
Final Temp.

#971837

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

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Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Luke Amies
Project name:	CALLIDE QUARTERY MONITORING
Project ID:	BC200153.03
Turnaround time:	5 Day
Date/Time received	Mar 13, 2023 3:35 PM
Eurofins reference	971837

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Luke Amies - lamies@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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ABN: 50 005 085 521

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IANZ# 1290

Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Project Name: CALLIDE QUARTERY MONITORING
Project ID: BC200153.03

Order No.:
Report #: 971837
Phone: 0400 497 512
Fax:

Received: Mar 13, 2023 3:35 PM
Due: Mar 20, 2023
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Iron	Manganese	Nitrate & Nitrite (as N)	pH (at 25 °C)	Phosphorus reactive (as P)	Total Suspended Solids Dried at 103 °C to 105 °C	Ion Balance Set	Eurofins Suite B11E: Cl/SO4/Alkalinity	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X				X		X		X	X			
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X		X		X		X	X	X	X
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	SD01_2902	Mar 01, 2023		Water	B23-Ma0034150	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SD02_0203	Mar 02, 2023		Water	B23-Ma0034151	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SD03_0303	Mar 03, 2023		Water	B23-Ma0034152	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SD04_0703	Mar 07, 2023		Water	B23-Ma0034153	X	X	X	X	X	X	X	X	X	X	X	X	X
5	SD05_0803	Mar 08, 2023		Water	B23-Ma0034154	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						5	5	5	5	5	5	5	5	5	5	5	5	5

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Luke Amies**

Report **971837-W**
Project name CALLIDE QUARTERY MONITORING
Project ID BC200153.03
Received Date Mar 13, 2023

Client Sample ID			**SD01_2902**	**SD02_0203**	**SD03_0303**	**SD04_0703**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**B23-Ma0034150**	**B23-Ma0034151**	**B23-Ma0034152**	**B23-Ma0034153**
Date Sampled			**Mar 01, 2023**	**Mar 02, 2023**	**Mar 03, 2023**	**Mar 07, 2023**
Test/Reference	LOR	Unit				
Ammonia (as N)	0.01	mg/L	< 0.01	< 0.01	< 0.01	0.03
Chloride	1	mg/L	510	140	2500	120
Conductivity (at 25 °C)	10	uS/cm	2400	950	12000	880
Nitrate & Nitrite (as N)	0.05	mg/L	11	< 0.05	< 0.05	< 0.05
pH (at 25 °C)	0.1	pH Units	7.1	7.2	7.5	7.2
Phosphorus reactive (as P)	0.01	mg/L	0.05	0.03	0.05	0.02
Sulphate (as SO4)	5	mg/L	43	54	1800	46
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	1300	520	7000	470
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	< 5	< 5	< 5	< 5
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	310	200	670	200
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	310	200	670	200
Ion Balance Set						
Ionic Balance*	0.01	%	4.0	-2.0	0.9	-2.6
Total Anions*	0.01	meq/L	21.5	9.1	121.3	8.3
Total Cations*	0.01	meq/L	23.3	8.7	123.5	7.9
Heavy Metals						
Iron	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Manganese	0.005	mg/L	< 0.005	0.64	0.053	0.17
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	160	59	100	54
Magnesium	0.5	mg/L	85	32	330	29
Potassium	0.5	mg/L	1.7	4.3	1.3	2.0
Sodium	0.5	mg/L	190	69	2100	64
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace						
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SD01_2902	SD02_0203	SD03_0303	SD04_0703
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			B23-Ma0034150	B23-Ma0034151	B23-Ma0034152	B23-Ma0034153
Date Sampled			Mar 01, 2023	Mar 02, 2023	Mar 03, 2023	Mar 07, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace						
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	0.001	< 0.001	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C4-PFBA (surr.)	1	%	100	76	34	76
13C5-PFPeA (surr.)	1	%	41	60	45	68
13C5-PFHxA (surr.)	1	%	100	104	88	117
13C4-PFHpA (surr.)	1	%	82	91	92	101
13C8-PFOA (surr.)	1	%	75	76	84	80
13C5-PFNA (surr.)	1	%	79	63	85	68
13C6-PFDA (surr.)	1	%	122	98	72	103
13C2-PFUnDA (surr.)	1	%	68	64	53	76
13C2-PFDoDA (surr.)	1	%	60	45	42	56
13C2-PFTeDA (surr.)	1	%	27	23	23	41
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	0.002	< 0.001	0.012	< 0.001
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	0.003	< 0.001	0.012	0.001
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	0.002	< 0.001	0.009	< 0.001
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	[N09]0.031	[N09]0.002	[N09]0.041	[N09]0.011
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	< 0.001	< 0.001	[N09]0.001	< 0.001
Perfluorooctanesulfonic acid (PFOS)[N11]	0.0001	ug/L	0.0033	0.0035	0.035	0.047
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C3-PFBS (surr.)	1	%	104	108	69	101
18O2-PFHxS (surr.)	1	%	72	85	58	82
13C8-PFOS (surr.)	1	%	142	119	97	106
Perfluoroalkyl sulfonamido substances- Ultra Trace						
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
13C8-FOSA (surr.)	1	%	114	97	83	104
D3-N-MeFOSA (surr.)	1	%	48	30	32	60
D5-N-EtFOSA (surr.)	1	%	53	31	36	78
D7-N-MeFOSE (surr.)	1	%	49	33	33	60
D9-N-EtFOSE (surr.)	1	%	43	31	29	56
D5-N-EtFOSAA (surr.)	1	%	102	94	94	126
D3-N-MeFOSAA (surr.)	1	%	97	89	64	96

Client Sample ID			SD01_2902	SD02_0203	SD03_0303	SD04_0703
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			B23-Ma0034150	B23-Ma0034151	B23-Ma0034152	B23-Ma0034153
Date Sampled			Mar 01, 2023	Mar 02, 2023	Mar 03, 2023	Mar 07, 2023
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C2-4:2 FTSA (surr.)	1	%	24	24	15	25
13C2-6:2 FTSA (surr.)	1	%	75	88	67	85
13C2-8:2 FTSA (surr.)	1	%	118	112	130	158
13C2-10:2 FTSA (surr.)	1	%	122	111	83	119
PFASs Summations						
Sum (PFHxS + PFOS)*	0.001	ug/L	0.0343	0.0055	0.076	0.058
Sum of US EPA PFAS (PFOS + PFOA)*	0.001	ug/L	0.0033	0.0035	0.035	0.047
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	ug/L	0.0343	0.0055	0.076	0.058
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	0.0363	0.0055	0.088	0.058
Sum of PFASs (n=30)*	0.005	ug/L	0.0413	0.0055	0.11	0.059

Client Sample ID			SD05_0803
Sample Matrix			Water
Eurofins Sample No.			B23-Ma0034154
Date Sampled			Mar 08, 2023
Test/Reference	LOR	Unit	
Ammonia (as N)	0.01	mg/L	< 0.01
Chloride	1	mg/L	220
Conductivity (at 25 °C)	10	uS/cm	1400
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05
pH (at 25 °C)	0.1	pH Units	7.0
Phosphorus reactive (as P)	0.01	mg/L	0.03
Sulphate (as SO4)	5	mg/L	100
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	810
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	< 5
Alkalinity (speciated)			
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	190
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20
Total Alkalinity (as CaCO3)	20	mg/L	190
Ion Balance Set			
Ionic Balance*	0.01	%	4.5
Total Anions*	0.01	meq/L	12.1
Total Cations*	0.01	meq/L	13.2
Heavy Metals			
Iron	0.05	mg/L	< 0.05
Manganese	0.005	mg/L	0.008

Client Sample ID			SD05_0803
Sample Matrix			**Water**
Eurofins Sample No.			**B23-Ma0034154**
Date Sampled			**Mar 08, 2023**
Test/Reference	LOR	Unit	
Eurofins Suite B11C: Na/K/Ca/Mg			
Calcium	0.5	mg/L	94
Magnesium	0.5	mg/L	51
Potassium	0.5	mg/L	1.5
Sodium	0.5	mg/L	99
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace			
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	< 0.005
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	< 0.001
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	< 0.001
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	< 0.001
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	< 0.001
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	< 0.001
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	< 0.001
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	< 0.001
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	< 0.001
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	< 0.001
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	< 0.001
13C4-PFBA (surr.)	1	%	76
13C5-PFPeA (surr.)	1	%	79
13C5-PFHxA (surr.)	1	%	101
13C4-PFHpA (surr.)	1	%	91
13C8-PFOA (surr.)	1	%	84
13C5-PFNA (surr.)	1	%	67
13C6-PFDA (surr.)	1	%	98
13C2-PFUnDA (surr.)	1	%	67
13C2-PFDoDA (surr.)	1	%	53
13C2-PFTeDA (surr.)	1	%	38
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	0.001
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	< 0.001
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	< 0.001
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	0.001
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	[N09]0.017
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	< 0.001
Perfluorooctanesulfonic acid (PFOS)[N11]	0.0001	ug/L	0.011
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	< 0.001
13C3-PFBS (surr.)	1	%	100
18O2-PFHxS (surr.)	1	%	76
13C8-PFOS (surr.)	1	%	133
Perfluoroalkyl sulfonamido substances- Ultra Trace			
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	< 0.005
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	< 0.005
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	< 0.005
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	< 0.005
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	< 0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	< 0.005

Client Sample ID			SD05_0803
Sample Matrix			Water
Eurofins Sample No.			B23-Ma0034154
Date Sampled			Mar 08, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances- Ultra Trace			
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	< 0.005
13C8-FOSA (surr.)	1	%	107
D3-N-MeFOSA (surr.)	1	%	47
D5-N-EtFOSA (surr.)	1	%	56
D7-N-MeFOSE (surr.)	1	%	44
D9-N-EtFOSE (surr.)	1	%	43
D5-N-EtFOSAA (surr.)	1	%	113
D3-N-MeFOSAA (surr.)	1	%	92
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	< 0.001
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	< 0.005
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	< 0.001
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	< 0.001
13C2-4:2 FTSA (surr.)	1	%	25
13C2-6:2 FTSA (surr.)	1	%	76
13C2-8:2 FTSA (surr.)	1	%	142
13C2-10:2 FTSA (surr.)	1	%	106
PFASs Summations			
Sum (PFHxS + PFOS)*	0.001	ug/L	0.028
Sum of US EPA PFAS (PFOS + PFOA)*	0.001	ug/L	0.011
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	ug/L	0.028
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	0.029
Sum of PFASs (n=30)*	0.005	ug/L	0.03

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Ammonia (as N)	Melbourne	Mar 16, 2023	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Conductivity (at 25 °C)	Brisbane	Mar 17, 2023	28 Days
- Method: APHA 2510B			
Nitrate & Nitrite (as N)	Melbourne	Mar 16, 2023	28 Days
- Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA			
pH (at 25 °C)	Brisbane	Mar 17, 2023	0 Days
- Method: APHA 4500-H+ B. Electrometric Method			
Phosphorus reactive (as P)	Melbourne	Mar 16, 2023	2 Days
- Method: APHA 4500-P			
Total Suspended Solids Dried at 103 °C to 105 °C	Brisbane	Mar 17, 2023	7 Days
- Method: APHA 2540 D			
Ion Balance Set	Melbourne	Mar 15, 2023	
- Method: APHA 1030E (1)			
Heavy Metals	Brisbane	Mar 17, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Brisbane	Mar 17, 2023	180 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11E: Cl/SO4/Alkalinity			
Chloride	Brisbane	Mar 20, 2023	28 Day
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Sulphate (as SO4)	Brisbane	Mar 21, 2023	28 Day
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Alkalinity (speciated)	Brisbane	Mar 17, 2023	14 Day
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Brisbane	Mar 17, 2023	7 Days
- Method: APHA 2540 C			
Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace			
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace	Brisbane	Mar 15, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace	Brisbane	Mar 17, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonamido substances- Ultra Trace	Brisbane	Mar 15, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) Ultra trace			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace	Brisbane	Mar 17, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
PFASs Summations	Brisbane	Mar 17, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			

eurofins

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Project ID: BC200153.03

Order No.:
Report #: 971837
Phone: 0400 497 512
Fax:

Received: Mar 13, 2023 3:35 PM
Due: Mar 20, 2023
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Iron	Manganese	Nitrate & Nitrite (as N)	pH (at 25 °C)	Phosphorus reactive (as P)	Total Suspended Solids Dried at 103 °C to 105 °C	Ion Balance Set	Eurofins Suite B11E: Cl/SO4/Alkalinity	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X				X		X		X	X			
Brisbane Laboratory - NATA # 1261 Site # 20794							X	X	X		X		X		X	X	X	X
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	SD01_2902	Mar 01, 2023		Water	B23-Ma0034150	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SD02_0203	Mar 02, 2023		Water	B23-Ma0034151	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SD03_0303	Mar 03, 2023		Water	B23-Ma0034152	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SD04_0703	Mar 07, 2023		Water	B23-Ma0034153	X	X	X	X	X	X	X	X	X	X	X	X	X
5	SD05_0803	Mar 08, 2023		Water	B23-Ma0034154	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						5	5	5	5	5	5	5	5	5	5	5	5	5

Date Reported:Mar 24, 2023

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphorus reactive (as P)	mg/L	< 0.01			0.01	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	mg/L	< 5			5	Pass	
Method Blank							
Heavy Metals							
Iron	mg/L	< 0.05			0.05	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.005			0.005	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.001			0.001	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.001			0.001	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.001			0.001	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.001			0.001	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.001			0.001	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.001			0.001	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.0001			0.0001	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances- Ultra Trace							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.005			0.005	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.005			0.005	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.005			0.005	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.005			0.005	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.005			0.005	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.005			0.005	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.005			0.005	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Ammonia (as N)	%	105			70-130	Pass	
Nitrate & Nitrite (as N)	%	101			70-130	Pass	
Phosphorus reactive (as P)	%	92			70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	%	113			70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	%	97			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Iron	%	93			80-120	Pass	
Manganese	%	92			80-120	Pass	
LCS - % Recovery							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	%	95			80-120	Pass	
Magnesium	%	97			80-120	Pass	
Potassium	%	94			80-120	Pass	
Sodium	%	94			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	%	116			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	130			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	126			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	117			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	117			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	114			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	107			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	138			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	142			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	148			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	145			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	%	70			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	134			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	130			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	71			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	128			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	105			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	110			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	75			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances- Ultra Trace							
Perfluorooctane sulfonamide (FOSA)	%	97			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	138			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	139			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	112			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	143			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	123			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	105			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	138			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)			%	127			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)			%	113			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)			%	122			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1					
Perfluorobutanoic acid (PFBA)	S23-Ma0024230	NCP	%	79			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S23-Ma0024230	NCP	%	99			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S23-Ma0024230	NCP	%	89			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S23-Ma0024230	NCP	%	99			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S23-Ma0024230	NCP	%	124			50-150	Pass	
Perfluorononanoic acid (PFNA)	S23-Ma0024230	NCP	%	80			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S23-Ma0024231	NCP	%	67			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S23-Ma0024231	NCP	%	66			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S23-Ma0024230	NCP	%	86			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S23-Ma0024231	NCP	%	66			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S23-Ma0024231	NCP	%	65			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1					
Perfluorooctane sulfonamide (FOSA)	S23-Ma0024231	NCP	%	54			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S23-Ma0024231	NCP	%	50			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S23-Ma0024231	NCP	%	84			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S23-Ma0024231	NCP	%	107			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S23-Ma0024231	NCP	%	68			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S23-Ma0024231	NCP	%	61			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S23-Ma0024231	NCP	%	63			50-150	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Iron	B23-Ma0034151	CP	%	96			75-125	Pass	
Manganese	B23-Ma0034151	CP	%	94			75-125	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	B23-Ma0034151	CP	%	118			75-125	Pass	
Magnesium	B23-Ma0034151	CP	%	95			75-125	Pass	
Potassium	B23-Ma0034151	CP	%	97			75-125	Pass	
Sodium	B23-Ma0034151	CP	%	79			75-125	Pass	
Spike - % Recovery									
				Result 1					
Ammonia (as N)	B23-Ma0034154	CP	%	94			70-130	Pass	
Nitrate & Nitrite (as N)	B23-Ma0034154	CP	%	124			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M23-Ma0036590	NCP	mg/L	0.06	0.07	25	30%	Pass	
Conductivity (at 25 °C)	B23-Ma0034142	NCP	uS/cm	5700	5700	<1	30%	Pass	
Nitrate & Nitrite (as N)	S23-Ma0037278	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
pH (at 25 °C)	B23-Ma0034142	NCP	pH Units	6.3	6.3	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Iron	B23-Ma0034150	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Manganese	B23-Ma0034145	NCP	mg/L	0.23	0.24	2.7	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	B23-Ma0034145	NCP	mg/L	230	240	2.3	30%	Pass	
Magnesium	B23-Ma0034145	NCP	mg/L	700	720	2.0	30%	Pass	
Potassium	B23-Ma0034150	CP	mg/L	1.7	1.5	15	30%	Pass	
Sodium	B23-Ma0034145	NCP	mg/L	5700	5800	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Ma0031155	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Ma0031155	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Ma0031155	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Ma0031155	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Ma0031155	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Ma0031155	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Ma0031155	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Ma0031155	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Ma0031155	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Ma0031155	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Ma0031155	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Ma0042825	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Ma0042825	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Ma0042825	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Ma0042825	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Ma0042825	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Ma0042825	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Ma0034144	NCP	ug/L	< 0.0001	0.0006	20	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Ma0042825	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Ma0031155	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Ma0031155	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Ma0031155	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Ma0031155	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Ma0031155	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Ma0031155	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Ma0031155	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Ma0042825	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Ma0042825	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Ma0042825	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Ma0042825	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids Dried at 180 °C ± 2 °C	B23-Ma0034151	CP	mg/L	520	480	8.2	30%	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	B23-Ma0034151	CP	mg/L	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Paige Howarth	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Inorganic
Jonathon Angell	Senior Analyst-Inorganic
Jonathon Angell	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-PFAS
Mary Makarios	Senior Analyst-Inorganic



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CERTIFICATE OF ANALYSIS

Work Order	: **EB2316807**	Page	: 1 of 15
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 07-Jun-2023 11:30
Order number	: ----	Date Analysis Commenced	: 08-Jun-2023
C-O-C number	: ----	Issue Date	: 13-Jun-2023 14:48
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 77		
No. of samples analysed	: 29		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X PFAS: Sample "EB2314305-024" shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EP231X PFAS: Sample "EB2314305-021" shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	AD404-0.5	AD404-3.0	AD404-4.0	AD404-10.0	AD405-0.5
			Sampling date / time	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316807-002	EB2316807-004	EB2316807-005	EB2316807-007	EB2316807-009
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**9.9**	**33.9**	**39.9**	**18.6**	**9.7**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	**0.0007**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	**0.0009**	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	AD404-0.5	AD404-3.0	AD404-4.0	AD404-10.0	AD405-0.5
			Sampling date / time	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316807-002	EB2316807-004	EB2316807-005	EB2316807-007	EB2316807-009
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	**0.0016**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	**0.0007**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	**0.0016**	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**106**	**104**	**99.0**	**102**	**103**
13C8-PFOA	----	0.0002	%	**110**	**114**	**108**	**104**	**102**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	AD405-4.0	AD406-0.5	AD406-4.5	AD407-0.5	AD407-4.0
				Sampling date / time	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00
Compound	CAS Number	LOR	Unit		EB2316807-012	EB2316807-016	EB2316807-020	EB2316807-027	EB2316807-031
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**39.8**	**5.7**	**24.3**	**7.4**	**12.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	**0.0004**	**0.0006**	<0.0002	**0.0006**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	AD405-4.0	AD406-0.5	AD406-4.5	AD407-0.5	AD407-4.0
			Sampling date / time	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316807-012	EB2316807-016	EB2316807-020	EB2316807-027	EB2316807-031
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	**0.0014**	**0.0006**	<0.0002	**0.0006**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	**0.0008**	**0.0006**	<0.0002	**0.0006**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	**0.0014**	**0.0006**	<0.0002	**0.0006**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**114**	**104**	**101**	**102**	**100**
13C8-PFOA	----	0.0002	%	**130**	**108**	**105**	**110**	**104**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	AD408-0.5	AD408-2.0	AD409-0.5	AD409-3.0	AD410-2.0
			Sampling date / time	30-May-2023 00:00	30-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316807-036	EB2316807-037	EB2316807-042	EB2316807-045	EB2316807-049
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**14.4**	**15.1**	**7.4**	**28.6**	**26.1**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	AD408-0.5	AD408-2.0	AD409-0.5	AD409-3.0	AD410-2.0
			Sampling date / time	30-May-2023 00:00	30-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316807-036	EB2316807-037	EB2316807-042	EB2316807-045	EB2316807-049
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**106**	**114**	**107**	**110**	**109**
13C8-PFOA	----	0.0002	%	**108**	**113**	**112**	**107**	**106**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	AD410-3.1	AD410-4.0	AD411-1.0	AD411-7.0	AD412-0.5
				Sampling date / time	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00
Compound	CAS Number	LOR	Unit		EB2316807-050	EB2316807-051	EB2316807-054	EB2316807-056	EB2316807-057
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**33.6**	**41.4**	**7.6**	**23.5**	**8.7**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	AD410-3.1	AD410-4.0	AD411-1.0	AD411-7.0	AD412-0.5
			Sampling date / time	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316807-050	EB2316807-051	EB2316807-054	EB2316807-056	EB2316807-057
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**96.0**	**124**	**126**	**120**	**109**
13C8-PFOA	----	0.0002	%	**116**	**102**	**110**	**114**	**115**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	AD412-2.0	AD413-0.2	AD414-0.5	AD414-2.0	AD415-1.0
			Sampling date / time	31-May-2023 00:00	31-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316807-059	EB2316807-061	EB2316807-063	EB2316807-064	EB2316807-069
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**10.0**	**7.9**	**11.7**	**10.8**	**11.2**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	**0.0009**	<0.0002	**0.0002**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	AD412-2.0	AD413-0.2	AD414-0.5	AD414-2.0	AD415-1.0
			Sampling date / time	31-May-2023 00:00	31-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316807-059	EB2316807-061	EB2316807-063	EB2316807-064	EB2316807-069
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	**0.0009**	<0.0002	**0.0005**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	**0.0009**	<0.0002	**0.0005**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	**0.0009**	<0.0002	**0.0005**	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**96.5**	**99.5**	**118**	**123**	**118**
13C8-PFOA	----	0.0002	%	**115**	**108**	**122**	**121**	**102**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	AD415-8.0	BD01_3005	BD01_3005	BD03_3105	----
				Sampling date / time	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	31-May-2023 00:00	----
Compound	CAS Number	LOR	Unit		EB2316807-074	EB2316807-075	EB2316807-076	EB2316807-077	--------
					Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**24.1**	**18.7**	**11.6**	**10.9**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	AD415-8.0	BD01_3005	BD01_3005	BD03_3105	----
				Sampling date / time	30-May-2023 00:00	30-May-2023 00:00	30-May-2023 00:00	31-May-2023 00:00	----
Compound	CAS Number	LOR	Unit		EB2316807-074	EB2316807-075	EB2316807-076	EB2316807-077	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**112**	**114**	**116**	**114**	----
13C8-PFOA	----	0.0002	%		**116**	**122**	**102**	**108**	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EB2316807**	Page	: 1 of 11
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 07-Jun-2023
Order number	: ----	Date Analysis Commenced	: 08-Jun-2023
C-O-C number	: ----	Issue Date	: 13-Jun-2023
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 77		
No. of samples analysed	: 29		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5099153)									
EB2314305-021	Anonymous	EA055: Moisture Content	----	0.1	%	76.0	76.2	0.4	0% - 20%
EB2316807-002	AD404-0.5	EA055: Moisture Content	----	0.1	%	9.9	9.6	3.3	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5099155)									
EB2316807-036	AD408-0.5	EA055: Moisture Content	----	0.1	%	14.4	14.5	0.0	0% - 20%
EB2316807-059	AD412-2.0	EA055: Moisture Content	----	0.1	%	10.0	10.3	2.6	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5099152)									
EB2314305-021	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0025	0.0019	26.0	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0033	0.0023	33.3	0% - 50%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0235	# 0.0164	35.6	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0017	0.0010	47.4	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0766	# 0.0494	43.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2316807-002	AD404-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5099154)									
EB2316807-036	AD408-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5099154) - continued									
EB2316807-036	AD408-0.5	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2316807-059	AD412-2.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5099152)									
EB2314305-021	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0016	0.0015	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0056	# 0.0045	21.4	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0012	0.0010	15.5	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0023	0.0018	28.4	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0004	0.0003	30.4	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2316807-002	AD404-0.5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5099154)									
EB2316807-036	AD408-0.5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5099154) - continued									
EB2316807-036	AD408-0.5	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2316807-059	AD412-2.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5099152)									
EB2314305-021	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2316807-002	AD404-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5099154)									
EB2316807-036	AD408-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2316807-059	AD412-2.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5099152)									
EB2314305-021	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0028	0.0022	24.6	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2316807-002	AD404-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5099152) - continued									
EB2316807-002	AD404-0.5	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5099154)									
EB2316807-036	AD408-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2316807-059	AD412-2.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099152)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	114	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	122	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	112	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	110	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	107	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	105	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099154)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	102	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	89.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	101	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	98.3	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	110	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099152)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099154)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	94.3	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	71.0	131

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099154) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.7	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099152)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.8	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	117	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	116	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099154)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.4	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099152)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	110	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	113	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	114	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	109	54.8	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099154)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	90.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	91.5	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	92.1	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	92.1	54.8	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099152)							
EB2314305-024	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	123	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	120	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	111	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	120	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# 169	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	120	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099154)							
EB2316807-037	AD408-2.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	110	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	120	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	106	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	122	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	125	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	127	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099152)							
EB2314305-024	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	112	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	120	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	114	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	118	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	106	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	119	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	105	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	113	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	103	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	96.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	124	69.0	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099154)							
EB2316807-037	AD408-2.0	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	102	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	105	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	107	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	109	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	107	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	116	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	110	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	117	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	118	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	110	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	107	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099152)							
EB2314305-024	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	127	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	127	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	116	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	123	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	123	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	111	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	130	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099154)							
EB2316807-037	AD408-2.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	116	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	108	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	120	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	120	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	122	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099152)							
EB2314305-024	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	118	62.0	145

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099152) - continued							
EB2314305-024	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	122	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	120	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	114	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099154)							
EB2316807-037	AD408-2.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	95.3	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	128	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	120	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2316807**	Page	: 1 of 7
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 07-Jun-2023
Site	: ----	Issue Date	: 13-Jun-2023
Sampler	: DANIEL PAPINCZAK	No. of samples received	: 77
Order number	: ----	No. of samples analysed	: 29

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2314305--021	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	35.6 %	0% - 20%	**RPD exceeds LOR based limits**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2314305--021	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	43.1 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EB2314305--021	Anonymous	**Perfluorohexanoic acid (PFHxA)**	307-24-4	21.4 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2314305--024	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	169 %	68.0-136%	**Recovery greater than upper data quality objective**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
AD404-0.5,	AD404-3.0,	**30-May-2023**	**----**	----	**----**	**08-Jun-2023**	13-Jun-2023	✓
AD404-4.0,	AD404-10.0,							
AD405-0.5,	AD405-4.0,							
AD406-0.5,	AD406-4.5,							
AD407-0.5,	AD407-4.0,							
AD408-0.5,	AD408-2.0,							
AD414-0.5,	AD414-2.0,							
AD415-1.0,	AD415-8.0,							
BD01_3005,	BD01_3005							
HDPE Soil Jar (EA055)								

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C) - Continued								
AD409-0.5,	AD409-3.0,	**31-May-2023**	**----**	----	**----**	**08-Jun-2023**	14-Jun-2023	✓
AD410-2.0,	AD410-3.1,							
AD410-4.0,	AD411-1.0,							
AD411-7.0,	AD412-0.5,							
AD412-2.0,	AD413-0.2,							
BD03_3105								
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
AD408-0.5,	AD408-2.0,	**30-May-2023**	**08-Jun-2023**	26-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
AD414-0.5,	AD414-2.0,							
AD415-1.0,	AD415-8.0,							
BD01_3005,	BD01_3005							
HDPE Soil Jar (EP231X)								
AD404-0.5,	AD404-3.0,	**30-May-2023**	**08-Jun-2023**	26-Nov-2023	✓	**13-Jun-2023**	18-Jul-2023	✓
AD404-4.0,	AD404-10.0,							
AD405-0.5,	AD405-4.0,							
AD406-0.5,	AD406-4.5,							
AD407-0.5,	AD407-4.0							
HDPE Soil Jar (EP231X)								
AD409-0.5,	AD409-3.0,	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
AD410-2.0,	AD410-3.1,							
AD410-4.0,	AD411-1.0,							
AD411-7.0,	AD412-0.5,							
AD412-2.0,	AD413-0.2,							
BD03_3105								

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) AD408-0.5, AD408-2.0, AD414-0.5, AD414-2.0, AD415-1.0, AD415-8.0, BD01_3005, BD01_3005	**30-May-2023**	**08-Jun-2023**	26-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) AD404-0.5, AD404-3.0, AD404-4.0, AD404-10.0, AD405-0.5, AD405-4.0, AD406-0.5, AD406-4.5, AD407-0.5, AD407-4.0	**30-May-2023**	**08-Jun-2023**	26-Nov-2023	✓	**13-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) AD409-0.5, AD409-3.0, AD410-2.0, AD410-3.1, AD410-4.0, AD411-1.0, AD411-7.0, AD412-0.5, AD412-2.0, AD413-0.2, BD03_3105	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) AD408-0.5, AD408-2.0, AD414-0.5, AD414-2.0, AD415-1.0, AD415-8.0, BD01_3005, BD01_3005	**30-May-2023**	**08-Jun-2023**	26-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) AD404-0.5, AD404-3.0, AD404-4.0, AD404-10.0, AD405-0.5, AD405-4.0, AD406-0.5, AD406-4.5, AD407-0.5, AD407-4.0	**30-May-2023**	**08-Jun-2023**	26-Nov-2023	✓	**13-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) AD409-0.5, AD409-3.0, AD410-2.0, AD410-3.1, AD410-4.0, AD411-1.0, AD411-7.0, AD412-0.5, AD412-2.0, AD413-0.2, BD03_3105	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) AD408-0.5, AD408-2.0, AD414-0.5, AD414-2.0, AD415-1.0, AD415-8.0, BD01_3005, BD01_3005	**30-May-2023**	**08-Jun-2023**	26-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) AD404-0.5, AD404-3.0, AD404-4.0, AD404-10.0, AD405-0.5, AD405-4.0, AD406-0.5, AD406-4.5, AD407-0.5, AD407-4.0	**30-May-2023**	**08-Jun-2023**	26-Nov-2023	✓	**13-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) AD409-0.5, AD409-3.0, AD410-2.0, AD410-3.1, AD410-4.0, AD411-1.0, AD411-7.0, AD412-0.5, AD412-2.0, AD413-0.2, BD03_3105	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) AD408-0.5, AD408-2.0, AD414-0.5, AD414-2.0, AD415-1.0, AD415-8.0, BD01_3005, BD01_3005	**30-May-2023**	**08-Jun-2023**	26-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) AD404-0.5, AD404-3.0, AD404-4.0, AD404-10.0, AD405-0.5, AD405-4.0, AD406-0.5, AD406-4.5, AD407-0.5, AD407-4.0	**30-May-2023**	**08-Jun-2023**	26-Nov-2023	✓	**13-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) AD409-0.5, AD409-3.0, AD410-2.0, AD410-3.1, AD410-4.0, AD411-1.0, AD411-7.0, AD412-0.5, AD412-2.0, AD413-0.2, BD03_3105	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2316807**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: k.hiltonbarber@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BC200153.03	Page	: 1 of 6
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DANIEL PAPINCZAK		

Dates

Date Samples Received	: 07-Jun-2023 11:30	Issue Date	: 07-Jun-2023
Client Requested Due Date	: 14-Jun-2023	Scheduled Reporting Date	: **14-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 7.5°C, 5.8°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 77 / 29

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- ***Samples were originally received by ALS Gladstone on 5/6/23 (6°C), and forwarded to ALS Brisbane for analysis.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2316807-001	30-May-2023 00:00	AD404-0.2	✓		
EB2316807-002	30-May-2023 00:00	AD404-0.5		✓	✓
EB2316807-003	30-May-2023 00:00	AD404-1.5	✓		
EB2316807-004	30-May-2023 00:00	AD404-3.0		✓	✓
EB2316807-005	30-May-2023 00:00	AD404-4.0		✓	✓
EB2316807-006	30-May-2023 00:00	AD404-6.0	✓		
EB2316807-007	30-May-2023 00:00	AD404-10.0		✓	✓
EB2316807-008	30-May-2023 00:00	AD405-0.2	✓		
EB2316807-009	30-May-2023 00:00	AD405-0.5		✓	✓
EB2316807-010	30-May-2023 00:00	AD405-1.5	✓		
EB2316807-011	30-May-2023 00:00	AD405-3.0	✓		
EB2316807-012	30-May-2023 00:00	AD405-4.0		✓	✓
EB2316807-013	30-May-2023 00:00	AD405-6.0	✓		
EB2316807-014	30-May-2023 00:00	AD405-9.0	✓		
EB2316807-015	30-May-2023 00:00	AD406-0.2	✓		
EB2316807-016	30-May-2023 00:00	AD406-0.5		✓	✓
EB2316807-017	30-May-2023 00:00	AD406-1.0	✓		
EB2316807-018	30-May-2023 00:00	AD406-2.0	✓		
EB2316807-019	30-May-2023 00:00	AD406-3.0	✓		
EB2316807-020	30-May-2023 00:00	AD406-4.5		✓	✓
EB2316807-021	30-May-2023 00:00	AD406-5.0	✓		
EB2316807-022	30-May-2023 00:00	AD406-6.0	✓		
EB2316807-023	30-May-2023 00:00	AD406-7.0	✓		
EB2316807-024	30-May-2023 00:00	AD406-8.0	✓		
EB2316807-025	30-May-2023 00:00	AD406-9.0	✓		
EB2316807-026	30-May-2023 00:00	AD407-0.2	✓		
EB2316807-027	30-May-2023 00:00	AD407-0.5		✓	✓
EB2316807-028	30-May-2023 00:00	AD407-1.0	✓		
EB2316807-029	30-May-2023 00:00	AD407-2.0	✓		
EB2316807-030	30-May-2023 00:00	AD407-3.0	✓		
EB2316807-031	30-May-2023 00:00	AD407-4.0		✓	✓
EB2316807-032	30-May-2023 00:00	AD407-6.0	✓		
EB2316807-033	30-May-2023 00:00	AD407-8.0	✓		
EB2316807-034	30-May-2023 00:00	AD407-9.0	✓		
EB2316807-035	30-May-2023 00:00	AD408-0.2	✓		

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2316807-036	30-May-2023 00:00	AD408-0.5		✓	✓
EB2316807-037	30-May-2023 00:00	AD408-2.0		✓	✓
EB2316807-038	30-May-2023 00:00	AD408-2.7	✓		
EB2316807-039	30-May-2023 00:00	AD408-4.0	✓		
EB2316807-040	30-May-2023 00:00	AD408-6.0	✓		
EB2316807-041	30-May-2023 00:00	AD408-10.0	✓		
EB2316807-042	31-May-2023 00:00	AD409-0.5		✓	✓
EB2316807-043	31-May-2023 00:00	AD409-1.1	✓		
EB2316807-044	31-May-2023 00:00	AD409-2.0	✓		
EB2316807-045	31-May-2023 00:00	AD409-3.0		✓	✓
EB2316807-046	31-May-2023 00:00	AD409-3.5	✓		
EB2316807-047	31-May-2023 00:00	AD410-0.5	✓		
EB2316807-048	31-May-2023 00:00	AD410-1.0	✓		
EB2316807-049	31-May-2023 00:00	AD410-2.0		✓	✓
EB2316807-050	31-May-2023 00:00	AD410-3.1		✓	✓
EB2316807-051	31-May-2023 00:00	AD410-4.0		✓	✓
EB2316807-052	31-May-2023 00:00	AD410-6.0	✓		
EB2316807-053	31-May-2023 00:00	AD411-0.5	✓		
EB2316807-054	31-May-2023 00:00	AD411-1.0		✓	✓
EB2316807-055	31-May-2023 00:00	AD411-3.0	✓		
EB2316807-056	31-May-2023 00:00	AD411-7.0		✓	✓
EB2316807-057	31-May-2023 00:00	AD412-0.5		✓	✓
EB2316807-058	31-May-2023 00:00	AD412-1.0	✓		
EB2316807-059	31-May-2023 00:00	AD412-2.0		✓	✓
EB2316807-060	31-May-2023 00:00	AD412-3.0	✓		
EB2316807-061	31-May-2023 00:00	AD413-0.2		✓	✓
EB2316807-062	30-May-2023 00:00	AD414-0.2	✓		
EB2316807-063	30-May-2023 00:00	AD414-0.5		✓	✓
EB2316807-064	30-May-2023 00:00	AD414-2.0		✓	✓
EB2316807-065	30-May-2023 00:00	AD414-4.5	✓		
EB2316807-066	30-May-2023 00:00	AD414-6.0	✓		
EB2316807-067	30-May-2023 00:00	AD414-10.0	✓		
EB2316807-068	30-May-2023 00:00	AD415-0.2	✓		
EB2316807-069	30-May-2023 00:00	AD415-1.0		✓	✓
EB2316807-070	30-May-2023 00:00	AD415-2.0	✓		
EB2316807-071	30-May-2023 00:00	AD415-3.0	✓		
EB2316807-072	30-May-2023 00:00	AD415-4.5	✓		
EB2316807-073	30-May-2023 00:00	AD415-6.0	✓		
EB2316807-074	30-May-2023 00:00	AD415-8.0		✓	✓
EB2316807-075	30-May-2023 00:00	BD01_3005		✓	✓
EB2316807-076	30-May-2023 00:00	BD01_3005		✓	✓

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2316807-077	31-May-2023 00:00	BD03_3105		✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

CS ENERGY ENVIRONMENTAL DATA

- *AU Certificate of Analysis - NATA (COA)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	CSEnergyEnvironmentData@csenergy.com.au
- Chain of Custody (CoC) (COC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ESDAT (ESDAT)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - XTab (XTAB)	Email	CSEnergyEnvironmentData@csenergy.com.au

EPIC

- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au
- EDI Format - XTab (XTAB)	Email	epicenvironmental@esdat.com.au

INVOICES

- *AU Certificate of Analysis - NATA (COA)	Email	accounts@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	accounts@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	accounts@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	accounts@epicenvironmental.com.au
- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	accounts@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	accounts@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	accounts@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	accounts@epicenvironmental.com.au

LABS

- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	labs@epicenvironmental.com.au

LUKE AMIES

- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au

LUKE AMIES

- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

epic ENVIRONMENTAL

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	AD4 Drilling
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	1 of 5
Number of Eskies:	4 (includes samples from separate workorder)

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 Day TAT
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE									ANALYSIS REQUIRED																HOLD
				Soil / Solid			Water / Liquid						Other	Soil PFAS (EP231X)															
				150-250ml Glass Jar	200ml Plastic Jar	- Plastic bag	2x 40ml Amber Vial	100-500ml Amber Bottle	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)																	
1	AD404-0.2	30/05/2023	S		1																								
2	AD404-0.5	30/05/2023	S		1									x															
3	AD404-1.5	30/05/2023	S		1																								
4	AD404-3.0	30/05/2023	S		1									x															
5	AD404-4.0	30/05/2023	S		1									x															
6	AD404-6.0	30/05/2023	S		1																								
7	AD404-10.0	30/05/2023	S		1									x															
8	AD405-0.2	30/05/2023	S		1																								
9	AD405-0.5	30/05/2023	S		1									x															
10	AD405-1.5	30/05/2023	S		1																								
11	AD405-3.0	30/05/2023	S		1									x															
12	AD405-4.0	30/05/2023	S		1																								
13	AD405-6.0	30/05/2023	S		1									x															
14	AD405-9.0	30/05/2023	S		1																								
15	AD406-0.2	30/05/2023	S		1																								
16	AD406-0.5	30/05/2023	S		1																								
17	AD406-1.0	30/05/2023	S		1									x															
18	AD406-2.0	30/05/2023	S		1																								
19	AD406-3.0	30/05/2023	S		1																								
20	AD406-4.5	30/05/2023	S		1									x															
			TOTALS		20																								

Environmental Division
Brisbane
Work Order Reference
EB2316807

Telephone : 61-7-3243 7222

Relinquished By:					
NAME	Dan Papinszak	SIGNATURE	DATE	02-Jun-23	
Received By:					
NAME	KSchafer	SIGNATURE	DATE	2-6-23	

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 17, 95 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

KSchafer 5.6.23 1500 Rec'd SW 6.6.23 11:30

194

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Chain of Custody Record

Project No:	BC200153.03
Project/Site:	Callide AD4 Drilling
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinzcak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	2 of 4
Number of Eskies:	4 (includes samples from separate workorder)

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 Day TAT
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE									ANALYSIS REQUIRED										HOLD
				Soil / Solid			Water / Liquid					Other	Soil PFAS (EP231X)										
				150-250ml Glass Jar	200ml Plastic Jar	Plastic bag	2x 40ml Amber Vial	100-500ml Amber Bottle	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)											
21	AD406-5.0	30/05/2023	S		1																		
22	AD406-6.0	30/05/2023	S		1																		
23	AD406-7.0	30/05/2023	S		1																		
24	AD406-8.0	30/05/2023	S		1																		
25	AD406-9.0	30/05/2023	S		1																		
26	AD407-0.2	30/05/2023	S		1																		
27	AD407-0.5	30/05/2023	S		1																		
28	AD407-1.0	30/05/2023	S		1								x										
29	AD407-2.0	30/05/2023	S		1																		
30	AD407-3.0	30/05/2023	S		1																		
31	AD407-4.0	30/05/2023	S		1																		
32	AD407-6.0	30/05/2023	S		1								x										
33	AD407-8.0	30/05/2023	S		1																		
34	AD407-9.0	30/05/2023	S		1																		
35	AD408-0.2	30/05/2023	S		1																		
36	AD408-0.5	30/05/2023	S		1																		
37	AD408-2.0	30/05/2023	S		1								x										
38	AD408-2.7	30/05/2023	S		1								x										
39	AD408-4.0	30/05/2023	S		1																		
40	AD408-6.0	30/05/2023	S		1																		
			TOTALS		20																		

Relinquished By:				Received By:			
NAME	Dan Papinszak	SIGNATURE		NAME	KSchafer	SIGNATURE	
DATE	02-Jun-23			DATE	2-6-23		

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 17, 95 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

KSchafer 5.6.23 1500 Rec'd SW 6.6.23 11:30

294

epic ENVIRONMENTAL

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	AD4 Drilling
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinzcak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	3 of 4
Number of Eskies:	4 (includes samples from separate workorder)

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 Day TAT
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE									ANALYSIS REQUIRED										HOLD
				Soil / Solid			Water / Liquid					Other	Soil PFAS (EP231X)										
				150-250ml Glass Jar	200ml Plastic Jar	- Plastic bag	2x 40ml Amber Vial	100-500ml Amber Bottle	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)											
41	AD408-10.0	30/05/2023	S		1																		
42	AD409-0.5	31/05/2023	S		1								x										
43	AD409-1.1	31/05/2023	S		1																		
44	AD409-2.0	31/05/2023	S		1																		
45	AD409-3.0	31/05/2023	S		1								x										
46	AD409-3.5	31/05/2023	S		1																		
47	AD410-0.5	31/05/2023	S		1																		
48	AD410-1.0	31/05/2023	S		1																		
49	AD410-2.0	31/05/2023	S		1								x										
50	AD410-3.1	31/05/2023	S		1								x										
51	AD410-4.0	31/05/2023	S		1								x										
52	AD410-6.0	31/05/2023	S		1																		
53	AD411-0.5	31/05/2023	S		1																		
54	AD411-1.0	31/05/2023	S		1								x										
55	AD411-3.0	31/05/2023	S		1																		
56	AD411-7.0	31/05/2023	S		1								x										
57	AD412-0.5	31/05/2023	S		1								x										
58	AD412-1.0	31/05/2023	S		1																		
59	AD412-2.0	31/05/2023	S		1																		
60	AD412-3.0	31/05/2023	S		1								x										
			TOTALS		20																		

Relinquished By:

NAME Dan Papinszak SIGNATURE DATE 02-Jun-23

Received By:

NAME Kschafer SIGNATURE DATE 2-6-23

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 17, 95 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

Kschafer 5.6.23 1500

Rec'd SW 6.6.23 11:30

3 of 4

epic ENVIRONMENTAL

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	AD4 Drilling
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinzcak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	4 of 5
Number of Eskies:	4 (includes samples from separate workorder)

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 Day TAT
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE: Soil / Solid 150-250ml Glass Jar	Soil / Solid 200ml Plastic Jar	Soil / Solid - Plastic bag	Water / Liquid 2x 40ml Amber Vial	Water / Liquid 100-500ml Amber Bottle	Water / Liquid 60ml Metals	Water / Liquid 60ml Nutrients	Water / Liquid 250-500ml Plastic (Unpreserved)	Water / Liquid 60-250ml Plastic (PFAS)	Other	ANALYSIS REQUIRED: Soil PFAS (EP231X)	HOLD
61	AD413-0.2	31/05/2023	S		1										
62	AD414-0.2	30/05/2023	S		1									x	
63	AD414-0.5	30/05/2023	S		1										
64	AD414-2.0	30/05/2023	S		1									x	
65	AD414-4.5	30/05/2023	S		1									x	
66	AD414-6.0	30/05/2023	S		1										
67	AD414-10.0	30/05/2023	S		1										
68	AD415-0.2	30/05/2023	S		1										
69	AD415-1.0	30/05/2023	S		1										
70	AD415-2.0	30/05/2023	S		1									x	
71	AD415-3.0	30/05/2023	S		1										
72	AD415-4.5	30/05/2023	S		1										
73	AD415-6.0	30/05/2023	S		1										
74	AD415-8.0	30/05/2023	S		1										
75	BD01_3005	30/05/2023	S		1									x	
76	BD01_3005	30/05/2023	S		1									x	
77	BD03_3105	31/05/2023	S		1									x	
														x	
			TOTALS		17										

Relinquished By:

NAME Dan Papinszak SIGNATURE DATE 02-Jun-23

Received By:

NAME Kschafer SIGNATURE DATE 2.6.23

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 17, 95 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

Kschafer 5.6.23 1500 Reid SW 6.6.23 11:30

4 of 4

epic ENVIRONMENTAL

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	AD4 Drilling
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinzcak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	5 of 5
Number of Eskies:	4 (includes samples from separate workorder)

Lab:	Please Send to Eurofins
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 Day TAT
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE									ANALYSIS REQUIRED		
				Soil / Solid			Water / Liquid								
				150-250ml Glass Jar	200ml Plastic Jar	- Plastic bag	2x 40ml Amber Vial	100-500ml Amber Bottle	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other	Soil PFAS (EP231X)	HOLD
1	SD01_3005	30/05/2023	S		1									x	
2	SD02_3005	30/05/2023	S		1									x	
3	SD03_3105	31/05/2023	S		1									x	
			TOTALS		3										

Relinquished By:				Received By:	
NAME	Dan Papinszak	SIGNATURE	DATE 02-Jun-23	NAME	SIGNATURE DATE

Custody Seals Intact Y N
Samples Received Chilled Y N
Method of Shipment

NOTES: Please report with CS Energy EDD format; ENVNC_V4

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email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

Date/Time: 01/06 13:50
Chilled: Yes / No
Temp: 9
Correction:
Final Temp:

98331

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IANZ# 1327

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IANZ# 1290

Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Luke Amies
Project name:	AD4 DRILLING
Project ID:	BC200153.03
Turnaround time:	5 Day
Date/Time received	Jun 7, 2023 12:00 AM
Eurofins reference	998331

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Luke Amies - lamies@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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IANZ# 1290

Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Project Name: AD4 DRILLING
Project ID: BC200153.03

Order No.:
Report #: 998331
Phone: 0400 497 512
Fax:

Received: Jun 7, 2023 12:00 AM
Due: Jun 14, 2023
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SD01_3005	May 30, 2023	1:50PM	Soil	B23-Jn0028026	X	X
2	SD02_3005	May 30, 2023	1:50PM	Soil	B23-Jn0028027	X	X
3	SD03_3105	May 30, 2023	1:50PM	Soil	B23-Jn0028028	X	X
Test Counts						3	3

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Luke Amies**

Report **998331-S**
Project name AD4 DRILLING
Project ID BC200153.03
Received Date Jun 07, 2023

Client Sample ID			**SD01_3005**	**SD02_3005**	**SD03_3105**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-Jn0028026**	**B23-Jn0028027**	**B23-Jn0028028**
Date Sampled			**May 30, 2023**	**May 30, 2023**	**May 30, 2023**
Test/Reference	LOR	Unit			
Sample Properties					
% Moisture	1	%	21	5.6	10
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	91	98	107
13C5-PFPeA (surr.)	1	%	92	93	96
13C5-PFHxA (surr.)	1	%	76	54	110
13C4-PFHpA (surr.)	1	%	82	80	109
13C8-PFOA (surr.)	1	%	73	88	102
13C5-PFNA (surr.)	1	%	63	81	104
13C6-PFDA (surr.)	1	%	80	72	106
13C2-PFUnDA (surr.)	1	%	70	55	114
13C2-PFDoDA (surr.)	1	%	61	62	89
13C2-PFTeDA (surr.)	1	%	54	27	109
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	170	49	99

Client Sample ID			SD01_3005	SD02_3005	SD03_3105
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			B23-Jn0028026	B23-Jn0028027	B23-Jn0028028
Date Sampled			May 30, 2023	May 30, 2023	May 30, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
D3-N-MeFOSA (surr.)	1	%	61	65	145
D5-N-EtFOSA (surr.)	1	%	95	113	116
D7-N-MeFOSE (surr.)	1	%	148	166	98
D9-N-EtFOSE (surr.)	1	%	66	49	95
D5-N-EtFOSAA (surr.)	1	%	43	41	144
D3-N-MeFOSAA (surr.)	1	%	32	37	161
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	79	66	108
18O2-PFHxS (surr.)	1	%	64	86	109
13C8-PFOS (surr.)	1	%	67	73	109
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	68	113	93
13C2-6:2 FTSA (surr.)	1	%	60	141	134
13C2-8:2 FTSA (surr.)	1	%	36	32	97
13C2-10:2 FTSA (surr.)	1	%	37	24	140
PFASs Summations					
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Brisbane	Jun 13, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jun 16, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jun 16, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jun 16, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jun 16, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Project Name: AD4 DRILLING
Project ID: BC200153.03

Order No.:
Report #: 998331
Phone: 0400 497 512
Fax:

Received: Jun 7, 2023 12:00 AM
Due: Jun 14, 2023
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SD01_3005	May 30, 2023	1:50PM	Soil	B23-Jn0028026	X	X
2	SD02_3005	May 30, 2023	1:50PM	Soil	B23-Jn0028027	X	X
3	SD03_3105	May 30, 2023	1:50PM	Soil	B23-Jn0028028	X	X
Test Counts						3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	85			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	108			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	88			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	120			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	99			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	112			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	105			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	89			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	82			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	88			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	106			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	85			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	111			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	103			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	127			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	89			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	134			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	121			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	103			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	73			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	64			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	89			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	76			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	113			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	87			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	115			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	113			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	70			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	92			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B23-Jn0029786	NCP	%	92			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Jn0029786	NCP	%	113			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Jn0029786	NCP	%	115			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Jn0029786	NCP	%	134			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B23-Jn0029786	NCP	%	87			50-150	Pass	
Perfluorononanoic acid (PFNA)	B23-Jn0029786	NCP	%	105			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B23-Jn0029786	NCP	%	95			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Jn0029786	NCP	%	126			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Jn0029786	NCP	%	130			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Jn0029786	NCP	%	132			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Jn0029786	NCP	%	110			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B23-Jn0029786	NCP	%	110			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Jn0029786	NCP	%	120			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Jn0029786	NCP	%	112			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Jn0029786	NCP	%	70			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Jn0029786	NCP	%	91			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Jn0029786	NCP	%	141			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Jn0029786	NCP	%	108			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B23-Jn0029786	NCP	%	132			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Jn0029786	NCP	%	106			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Jn0029786	NCP	%	92			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Jn0029786	NCP	%	105			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Jn0029786	NCP	%	63			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Jn0029786	NCP	%	92			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Jn0029786	NCP	%	107			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Jn0029786	NCP	%	103			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Jn0029786	NCP	%	51			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Jn0029786	NCP	%	82			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Jn0029786	NCP	%	103			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Jn0029786	NCP	%	127			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-Jn0028026	CP	%	21	19	12	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Jn0028093	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Jn0028093	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Jn0028093	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Jn0028093	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CERTIFICATE OF ANALYSIS

Work Order	: **EB2316811**	Page	: 1 of 17
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 06-Jun-2023 11:30
Order number	: ----	Date Analysis Commenced	: 08-Jun-2023
C-O-C number	: ----	Issue Date	: 16-Jun-2023 08:58
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 34		
No. of samples analysed	: 23		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Acid Sulphate Soils, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Morgan Lennox	Senior Organic Chemist	Brisbane Organics, Stafford, QLD
Satishkumar Trivedi	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EG005T (Total Metals by ICP-AES): MW97-3.3 (EB2316811-028) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EP231X-SUT PFAS Super Ultra Trace: High LCS recovery for EtFOSAA and PFPeS deemed acceptable as associated results are less than the limit of reporting.
- EP231X-SUT PFAS Super Ultra Trace: The LORs of particular analytes for sample ‘Coal Hopper’ (EB2316811-034) has been raised due to sample matrix interferences.
- EP231X PFAS: The LOR of PFOS for sample ‘CA-SS03’ (EB2316811-032) has been raised due to matrix interference.
- It is recognised that EK059G (Nitrite + Nitrate) is less than EK057G (Nitrite) for sample EB2316811-034 (Coal Hopper). However, the difference is within experimental variation of the methods.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA17-0.2	CA17-0.7	CA18-0.5	CA18-1.0	CA19-0.2
			Sampling date / time	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316811-001	EB2316811-002	EB2316811-004	EB2316811-005	EB2316811-007
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**12.4**	**11.6**	**15.2**	**14.1**	**16.6**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	**0.0005**	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA17-0.2	CA17-0.7	CA18-0.5	CA18-1.0	CA19-0.2
			Sampling date / time	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00	31-May-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316811-001	EB2316811-002	EB2316811-004	EB2316811-005	EB2316811-007
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	**0.0005**	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	**0.0005**	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	**0.0005**	<0.0002	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**108**	**94.0**	**110**	**95.5**	**85.5**
13C8-PFOA	----	0.0002	%	**108**	**98.5**	**102**	**102**	**102**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA19-0.6	MW95-0.2	MW95-1.0	MW95-2.0	MW95-4.0
			Sampling date / time	31-May-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316811-008	EB2316811-010	EB2316811-011	EB2316811-012	EB2316811-013
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**9.5**	**12.4**	**15.9**	**6.8**	**12.3**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	**0.0005**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA19-0.6	MW95-0.2	MW95-1.0	MW95-2.0	MW95-4.0
			Sampling date / time	31-May-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316811-008	EB2316811-010	EB2316811-011	EB2316811-012	EB2316811-013
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	**0.0005**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	**0.0005**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	**0.0005**	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**90.0**	**110**	**116**	**87.0**	**89.5**
13C8-PFOA	----	0.0002	%	**104**	**102**	**106**	**106**	**102**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW95#2-2.0	MW96#2-0.8	MW96#2-3.0	MW96#3-6.0	MW97-0.2
				Sampling date / time	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2316811-015	EB2316811-020	EB2316811-022	EB2316811-024	EB2316811-025
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**15.6**	**8.5**	**15.2**	**7.7**	**15.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW95#2-2.0	MW96#2-0.8	MW96#2-3.0	MW96#3-6.0	MW97-0.2
				Sampling date / time	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2316811-015	EB2316811-020	EB2316811-022	EB2316811-024	EB2316811-025
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**94.0**	**88.0**	**112**	**120**	**76.5**
13C8-PFOA	----	0.0002	%		**99.0**	**102**	**99.5**	**101**	**95.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	MW97-2.0	MW97-3.3	BD04_0106	CA-SS01	CA-SS02
			Sampling date / time	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	02-Jun-2023 00:00	02-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2316811-027	EB2316811-028	EB2316811-029	EB2316811-030	EB2316811-031
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	----	9.3	----	----	----
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	107	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	15.4	15.1	14.9	1.5	6.3
EG005(ED093)T: Total Metals by ICP-AES								
Iron	7439-89-6	50	mg/kg	----	21700	----	----	----
Manganese	7439-96-5	5	mg/kg	----	440	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	0.22	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0003	0.0003	0.0010
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	0.0003	0.0007
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	0.0004

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW97-2.0	MW97-3.3	BD04_0106	CA-SS01	CA-SS02
				Sampling date / time	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	02-Jun-2023 00:00	02-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2316811-027	EB2316811-028	EB2316811-029	EB2316811-030	EB2316811-031
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0005**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	**0.0005**	**0.0006**	**0.0026**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	**0.0005**	**0.0003**	**0.0010**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW97-2.0	MW97-3.3	BD04_0106	CA-SS01	CA-SS02
				Sampling date / time	01-Jun-2023 00:00	01-Jun-2023 00:00	01-Jun-2023 00:00	02-Jun-2023 00:00	02-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2316811-027	EB2316811-028	EB2316811-029	EB2316811-030	EB2316811-031
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	**0.0005**	**0.0003**	**0.0010**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**101**	**122**	**114**	**92.5**	**99.5**
13C8-PFOA	----	0.0002	%		**97.5**	**106**	**110**	**107**	**99.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA-SS03	CA-SS04	----	----	----
			Sampling date / time	02-Jun-2023 00:00	02-Jun-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2316811-032	EB2316811-033	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**2.7**	**1.4**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0003	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	**0.0004**	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	**0.0002**	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CA-SS03	CA-SS04	----	----	----
			Sampling date / time	02-Jun-2023 00:00	02-Jun-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2316811-032	EB2316811-033	--------	--------	--------
				Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	**0.0006**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**113**	**100**	----	----	----
13C8-PFOA	----	0.0002	%	**106**	**110**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Coal Hopper	----	----	----	----
			Sampling date / time	02-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2316811-034	--------	--------	--------	--------
				Result	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**293**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**293**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**12**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**12**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**29**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**7**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**31**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**22**	----	----	----	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.04**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	**0.045**	----	----	----	----
Iron	7439-89-6	0.05	mg/L	**0.15**	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.2**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**40.2**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.12**	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.03**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**5.24**	----	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**6.44**	----	----	----	----
ø Total Cations	----	0.01	meq/L	**6.80**	----	----	----	----
ø Ionic Balance	----	0.01	%	**2.74**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Coal Hopper	----	----	----	----
				Sampling date / time	02-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2316811-034	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0007	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0010**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.0311**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0009	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0010**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Coal Hopper	----	----	----	----
				Sampling date / time	02-Jun-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2316811-034	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.0010**	----	----	----	----
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.0331**	----	----	----	----
^ **Sum of PFAS**	----	0.0002	µg/L		**0.0331**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**94.8**	----	----	----	----
13C8-PFOA	----	0.0005	%		**103**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2316811**	Page	: 1 of 20
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 06-Jun-2023
Order number	: ----	Date Analysis Commenced	: 08-Jun-2023
C-O-C number	: ----	Issue Date	: 16-Jun-2023
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 34		
No. of samples analysed	: 23		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Acid Sulphate Soils, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Morgan Lennox	Senior Organic Chemist	Brisbane Organics, Stafford, QLD
Satishkumar Trivedi	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5099184)									
EB2316811-028	MW97-3.3	EG005T: Manganese	7439-96-5	5	mg/kg	440	534	19.4	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	21700	# 26800	21.2	0% - 20%
EA002: pH 1:5 (Soils) (QC Lot: 5100200)									
EB2317145-008	Anonymous	EA002: pH Value	----	0.1	pH Unit	6.2	6.2	0.0	0% - 20%
EB2315710-003	Anonymous	EA002: pH Value	----	0.1	pH Unit	10.0	10.0	0.0	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 5100201)									
EB2317145-008	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	31	27	12.8	0% - 20%
EB2315710-003	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	354	394	10.7	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5099155)									
EB2316807-036	Anonymous	EA055: Moisture Content	----	0.1	%	14.4	14.5	0.0	0% - 20%
EB2316807-059	Anonymous	EA055: Moisture Content	----	0.1	%	10.0	10.3	2.6	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5099157)									
EB2316811-002	CA17-0.7	EA055: Moisture Content	----	0.1	%	11.6	12.0	3.3	0% - 20%
EB2316811-020	MW96#2-0.8	EA055: Moisture Content	----	0.1	%	8.5	8.4	1.7	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5099159)									
EB2316811-033	CA-SS04	EA055: Moisture Content	----	0.1	%	1.4	1.6	15.7	0% - 50%
EB2317112-081	Anonymous	EA055: Moisture Content	----	0.1	%	17.6	15.0	16.3	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 5109120)									
EB2314446-017	Anonymous	EP003: Total Organic Carbon	----	0.02	%	0.70	0.70	0.0	0% - 20%
EB2317137-001	Anonymous	EP003: Total Organic Carbon	----	0.02	%	19.3	19.0	1.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5099154)									
EB2316807-036	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5099154) - continued									
EB2316807-036	Anonymous	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2316807-059	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5099156)									
EB2316811-002	CA17-0.7	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2316811-020	MW96#2-0.8	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5099158)									
EB2316811-033	CA-SS04	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2317112-064	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5099154)									
EB2316807-036	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5099154) - continued									
EB2316807-036	Anonymous	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2316807-059	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5099156)									
EB2316811-002	CA17-0.7	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2316811-020	MW96#2-0.8	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5099156) - continued									
EB2316811-020	MW96#2-0.8	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5099158)									
EB2316811-033	CA-SS04	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2317112-064	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5099154)									
EB2316807-036	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5099154) - continued									
EB2316807-059	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5099156)									
EB2316811-002	CA17-0.7	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2316811-020	MW96#2-0.8	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5099158)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5099158) - continued									
EB2316811-033	CA-SS04	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2317112-064	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5099154)									
EB2316807-036	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2316807-059	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5099154) - continued									
EB2316807-059	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5099156)									
EB2316811-002	CA17-0.7	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2316811-020	MW96#2-0.8	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5099158)									
EB2316811-033	CA-SS04	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2317112-064	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5104883)									
EB2317425-014	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5104883) - continued									
EB2317425-014	Anonymous	ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	14	13	0.0	0% - 50%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	77	76	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	90	90	1.2	0% - 20%
EB2317425-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	14	15	0.0	0% - 50%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	74	74	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	88	89	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5109354)									
EB2316811-034	Coal Hopper	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	12	13	0.0	0% - 50%
EB2317659-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5109355)									
EB2316811-034	Coal Hopper	ED045G: Chloride	16887-00-6	1	mg/L	12	12	0.0	0% - 50%
EB2317659-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2530	2620	3.7	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5103054)									
EB2317109-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2	2	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	4	4	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	1820	1870	2.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	32	32	0.0	0% - 20%
EB2317100-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	440	434	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1250	1240	0.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	10600	1.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	395	396	0.0	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 5103105)									
EB2317100-009	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2317100-001	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5104882)									
EB2317425-014	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.6	0.6	0.0	No Limit
EB2317425-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.8	0.8	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5110346)									
EB2316811-034	Coal Hopper	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	40.2	40.8	1.6	0% - 20%
EB2317418-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.07	27.9	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5109356)									
EB2316811-034	Coal Hopper	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.12	0.12	0.0	0% - 50%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5110347)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5110347) - continued									
EB2316811-034	Coal Hopper	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.03	0.03	0.0	No Limit
EB2317418-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.03	0.03	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5109357)									
EB2316811-034	Coal Hopper	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	5.24	5.43	3.5	0% - 20%
EB2317659-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5099184)								
EG005T: Iron	7439-89-6	50	mg/kg	<50	30690 mg/kg	83.3	70.0	120
EG005T: Manganese	7439-96-5	5	mg/kg	<5	464.9485 mg/kg	92.3	84.0	113
EA002: pH 1:5 (Soils) (QCLot: 5100200)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.4	98.0	102
EA010: Conductivity (1:5) (QCLot: 5100201)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	102	97.0	103
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 5109120)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	0.55 %	105	80.0	120
				<0.02	32.3 %	99.2	80.0	120
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099154)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	102	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	89.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	101	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	98.3	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	110	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099156)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	100	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	102	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	101	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	109	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	96.2	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099158)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	104	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	122	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	101	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	104	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	118	68.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099158) - continued								
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	93.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099154)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	94.3	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.7	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099156)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	94.0	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.0	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099158)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	102	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	64.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099158) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099154)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.4	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099156)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.5	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.2	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099158)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	103	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.2	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	63.0	144

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099158) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099154)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	90.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	91.5	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	92.1	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	92.1	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099156)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	92.7	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	126	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	124	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099158)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	93.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	97.9	54.8	124

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED037P: Alkalinity by PC Titrator (QCLot: 5104883)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	94.6	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5109354)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.0	85.0	118
				<1	100 mg/L	90.7	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 5109355)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	106	90.0	115
				<1	1000 mg/L	106	90.0	115
ED093F: Dissolved Major Cations (QCLot: 5103054)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5103105)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 5103105) - continued								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	102	80.0	114
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	110	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 5104882)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	10 mg/L	96.4	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5110346)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	95.6	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5109356)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.45 mg/L	94.0	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5110347)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.6	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5109357)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	83.4	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5104912)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	125	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	# 152	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	128	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	128	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	128	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	133	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5104912)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	128	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	118	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	128	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	124	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	124	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	130	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	124	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	123	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	122	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	107	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	123	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5104912)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	128	67.0	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5104912) - continued								
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	98.9	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	140	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	125	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	136	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	136	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	# 141	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5104912)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	131	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	138	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	136	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	129	53.1	133
EP231P: PFAS Sums (QCLot: 5104912)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099154)							
EB2316807-037	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	110	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	120	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	106	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	122	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	125	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	127	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099156)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099156) - continued							
EB2316811-004	CA18-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	106	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	102	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	96.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	105	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	83.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	91.2	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5099158)							
EB2317103-009	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	107	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	118	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	104	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	105	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	99.1	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	103	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099154)							
EB2316807-037	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	102	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	105	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	107	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	109	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	107	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	116	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	110	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	117	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	118	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	110	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	107	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099156)							
EB2316811-004	CA18-0.5	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	95.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	110	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	99.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	98.0	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	109	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	105	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	110	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	118	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	117	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	109	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099158)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5099158) - continued							
EB2317103-009	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	94.9	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	96.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	103	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	103	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	105	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	98.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	96.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	100	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	102	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	99.8	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099154)							
EB2316807-037	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	116	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	108	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	109	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	120	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	120	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	122	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099156)							
EB2316811-004	CA18-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	114	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	107	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	96.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	119	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	108	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	127	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	97.2	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099158)							
EB2317103-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	100	48.0	128

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5099158) - continued							
EB2317103-009	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	93.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	103	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	104	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	98.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	106	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	104	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099154)							
EB2316807-037	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	95.3	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	128	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	120	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099156)							
EB2316811-004	CA18-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	89.7	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	95.3	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	107	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	87.1	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5099158)							
EB2317103-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	91.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	99.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	97.1	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	102	70.0	130

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5109354)							
EB2317418-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	105	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5109355)							
EB2317418-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	118	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5103105)							
EB2317100-001	Anonymous	EG020A-T: Manganese	7439-96-5	5 mg/L	100	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5104882)							
EB2316811-034	Coal Hopper	EK040P: Fluoride	16984-48-8	5 mg/L	91.0	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5110346)							
EB2317281-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	99.4	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5109356)							
EB2317418-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	101	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5110347)							
EB2317281-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	97.8	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5109357)							
EB2317418-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	95.6	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2316811**	Page	: 1 of 13
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 06-Jun-2023
Site	: ----	Issue Date	: 16-Jun-2023
Sampler	: DANIEL PAPINCZAK	No. of samples received	: 34
Order number	: ----	No. of samples analysed	: 23

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	EB2316811--028	MW97-3.3	**Iron**	7439-89-6	21.2 %	0% - 20%	**RPD exceeds LOR based limits**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	QC-5104912-002	----	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	152 %	71.0-127%	**Recovery greater than upper control limit**
EP231C: Perfluoroalkyl Sulfonamides	QC-5104912-002	----	**N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)**	2991-50-6	141 %	61.0-135%	**Recovery greater than upper control limit**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / **Container** / Client Sample ID(s)	*Extraction / Preparation*			*Analysis*		
	Date extracted	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA002: pH 1:5 (Soils)						
Pulp Bag						
MW97-3.3	12-Jun-2023	08-Jun-2023	**4**	----	----	----
EA010: Conductivity (1:5)						
Pulp Bag						
MW97-3.3	12-Jun-2023	08-Jun-2023	**4**	----	----	----

Matrix: **WATER**

Method / **Container** / Client Sample ID(s)	*Extraction / Preparation*			*Analysis*		
	Date extracted	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
Coal Hopper	----	----	----	12-Jun-2023	09-Jun-2023	**3**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
Coal Hopper	----	----	----	14-Jun-2023	04-Jun-2023	**10**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
Coal Hopper	----	----	----	14-Jun-2023	04-Jun-2023	**10**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
	0				
Matrix Spikes (MS)					
Total Metals by ICP-AES	0	3	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
	0				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA002: pH 1:5 (Soils)							
Pulp Bag (EA002)							
MW97-3.3	**01-Jun-2023**	**12-Jun-2023**	08-Jun-2023	×	**12-Jun-2023**	12-Jun-2023	✓
EA010: Conductivity (1:5)							
Pulp Bag (EA010)							
MW97-3.3	**01-Jun-2023**	**12-Jun-2023**	08-Jun-2023	×	**12-Jun-2023**	10-Jul-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
MW95-0.2, MW95-1.0, MW95-2.0, MW95-4.0, MW95#2-2.0, MW96#2-0.8, MW96#2-3.0, MW96#3-6.0, MW97-0.2, MW97-2.0, MW97-3.3, BD04_0106	**01-Jun-2023**	**----**	----	----	**08-Jun-2023**	15-Jun-2023	✓
HDPE Soil Jar (EA055)							
CA-SS01, CA-SS02, CA-SS03, CA-SS04	**02-Jun-2023**	**----**	----	----	**08-Jun-2023**	16-Jun-2023	✓
HDPE Soil Jar (EA055)							
CA17-0.2, CA17-0.7, CA18-0.5, CA18-1.0, CA19-0.2, CA19-0.6	**31-May-2023**	**----**	----	----	**08-Jun-2023**	14-Jun-2023	✓
EG005(ED093)T: Total Metals by ICP-AES							
Pulp Bag (EG005T)							
MW97-3.3	**01-Jun-2023**	**08-Jun-2023**	28-Nov-2023	✓	**09-Jun-2023**	28-Nov-2023	✓
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003)							
MW97-3.3	**01-Jun-2023**	**14-Jun-2023**	29-Jun-2023	✓	**14-Jun-2023**	29-Jun-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
MW95-0.2, MW95-1.0, MW95-2.0, MW95-4.0, MW95#2-2.0, MW96#2-0.8, MW96#2-3.0, MW96#3-6.0, MW97-0.2, MW97-2.0, MW97-3.3, BD04_0106	**01-Jun-2023**	**08-Jun-2023**	28-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X)							
CA-SS01, CA-SS02, CA-SS03	**02-Jun-2023**	**08-Jun-2023**	29-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X)							
CA-SS04	**02-Jun-2023**	**09-Jun-2023**	29-Nov-2023	✓	**13-Jun-2023**	19-Jul-2023	✓
HDPE Soil Jar (EP231X)							
CA17-0.2	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X)							
CA17-0.7, CA18-0.5, CA18-1.0, CA19-0.2, CA19-0.6	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) MW95-0.2, MW95-1.0, MW95-2.0, MW95-4.0, MW95#2-2.0, MW96#2-0.8, MW96#2-3.0, MW96#3-6.0, MW97-0.2, MW97-2.0, MW97-3.3, BD04_0106	**01-Jun-2023**	**08-Jun-2023**	28-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA-SS01, CA-SS02, CA-SS03	**02-Jun-2023**	**08-Jun-2023**	29-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA-SS04	**02-Jun-2023**	**09-Jun-2023**	29-Nov-2023	✓	**13-Jun-2023**	19-Jul-2023	✓
HDPE Soil Jar (EP231X) CA17-0.2	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA17-0.7, CA18-0.5, CA18-1.0, CA19-0.2, CA19-0.6	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) MW95-0.2, MW95-1.0, MW95-2.0, MW95-4.0, MW95#2-2.0, MW96#2-0.8, MW96#2-3.0, MW96#3-6.0, MW97-0.2, MW97-2.0, MW97-3.3, BD04_0106	**01-Jun-2023**	**08-Jun-2023**	28-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA-SS01, CA-SS02, CA-SS03	**02-Jun-2023**	**08-Jun-2023**	29-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA-SS04	**02-Jun-2023**	**09-Jun-2023**	29-Nov-2023	✓	**13-Jun-2023**	19-Jul-2023	✓
HDPE Soil Jar (EP231X) CA17-0.2	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA17-0.7, CA18-0.5, CA18-1.0, CA19-0.2, CA19-0.6	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) MW95-0.2, MW95-1.0, MW95-2.0, MW95-4.0, MW95#2-2.0, MW96#2-0.8, MW96#2-3.0, MW96#3-6.0, MW97-0.2, MW97-2.0, MW97-3.3, BD04_0106	**01-Jun-2023**	**08-Jun-2023**	28-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA-SS01, CA-SS02, CA-SS03	**02-Jun-2023**	**08-Jun-2023**	29-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA-SS04	**02-Jun-2023**	**09-Jun-2023**	29-Nov-2023	✓	**13-Jun-2023**	19-Jul-2023	✓
HDPE Soil Jar (EP231X) CA17-0.2	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA17-0.7, CA18-0.5, CA18-1.0, CA19-0.2, CA19-0.6	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) MW95-0.2, MW95-1.0, MW95-2.0, MW95-4.0, MW95#2-2.0, MW96#2-0.8, MW96#2-3.0, MW96#3-6.0, MW97-0.2, MW97-2.0, MW97-3.3, BD04_0106	**01-Jun-2023**	**08-Jun-2023**	28-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA-SS01, CA-SS02, CA-SS03	**02-Jun-2023**	**08-Jun-2023**	29-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA-SS04	**02-Jun-2023**	**09-Jun-2023**	29-Nov-2023	✓	**13-Jun-2023**	19-Jul-2023	✓
HDPE Soil Jar (EP231X) CA17-0.2	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**12-Jun-2023**	18-Jul-2023	✓
HDPE Soil Jar (EP231X) CA17-0.7, CA18-0.5, CA18-1.0, CA19-0.2, CA19-0.6	**31-May-2023**	**08-Jun-2023**	27-Nov-2023	✓	**15-Jun-2023**	18-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
Coal Hopper	**02-Jun-2023**	**----**	----	**----**	**12-Jun-2023**	16-Jun-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
Coal Hopper	**02-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	30-Jun-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
Coal Hopper	**02-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	30-Jun-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
Coal Hopper	**02-Jun-2023**	**----**	----	**----**	**12-Jun-2023**	09-Jun-2023	×
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
Coal Hopper	**02-Jun-2023**	**12-Jun-2023**	29-Nov-2023	✓	**12-Jun-2023**	29-Nov-2023	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
Coal Hopper	**02-Jun-2023**	**----**	----	**----**	**12-Jun-2023**	30-Jun-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
Coal Hopper	**02-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	30-Jun-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
Coal Hopper	**02-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	04-Jun-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
Coal Hopper	**02-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	30-Jun-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
Coal Hopper	**02-Jun-2023**	**----**	----	**----**	**14-Jun-2023**	04-Jun-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT)							
Coal Hopper	**02-Jun-2023**	**12-Jun-2023**	29-Nov-2023	✓	**14-Jun-2023**	29-Nov-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT)							
Coal Hopper	**02-Jun-2023**	**12-Jun-2023**	29-Nov-2023	✓	**14-Jun-2023**	29-Nov-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT)							
Coal Hopper	**02-Jun-2023**	**12-Jun-2023**	29-Nov-2023	✓	**14-Jun-2023**	29-Nov-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT)							
Coal Hopper	**02-Jun-2023**	**12-Jun-2023**	29-Nov-2023	✓	**14-Jun-2023**	29-Nov-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT)							
Coal Hopper	**02-Jun-2023**	**12-Jun-2023**	29-Nov-2023	✓	**14-Jun-2023**	29-Nov-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Electrical Conductivity (1:5)	EA010	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	6	53	**11.32**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	6	59	**10.17**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Electrical Conductivity (1:5)	EA010	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	59	**5.08**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Electrical Conductivity (1:5)	EA010	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	59	**5.08**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	59	**5.08**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	0	3	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	6	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	6	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Organic Carbon	EP003	SOIL	In house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automatically measured by infra-red detector.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Dry and Pulverise (up to 100g)	GEO30	SOIL	#

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2316811**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: k.hiltonbarber@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BC200153.03	Page	: 1 of 4
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DANIEL PAPINCZAK		

Dates

Date Samples Received	: 06-Jun-2023 11:30	Issue Date	: 09-Jun-2023
Client Requested Due Date	: 15-Jun-2023	Scheduled Reporting Date	: **15-Jun-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 8.9, 4.7°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 34 / 23

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- ***Samples were originally received by ALS Gladstone on 05/06/23 (4.0°C), and forwarded to ALS Brisbane for analysis.**
- ****SRN Reissued 09/06/2023: As per email from Michael Kowalczyk on 09/06/2023, EK055G, NT-01 & NT-02, NT-04, EP231X-SUT, EK071G & EG020T assigned to EB2316811_034 (Coal Hopper).***
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **Sample "SD04_0106" has been forwarded to Eurofins, as requested. Please note that this will incur a freight forwarding fee.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA010 (solids): Electrical Conductivity (1:5)	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2316811-001	31-May-2023 00:00	CA17-0.2				✓			✓
EB2316811-002	31-May-2023 00:00	CA17-0.7				✓			✓
EB2316811-003	31-May-2023 00:00	CA17-1.4	✓						
EB2316811-004	31-May-2023 00:00	CA18-0.5				✓			✓
EB2316811-005	31-May-2023 00:00	CA18-1.0				✓			✓
EB2316811-006	31-May-2023 00:00	CA18-1.8	✓						
EB2316811-007	31-May-2023 00:00	CA19-0.2				✓			✓
EB2316811-008	31-May-2023 00:00	CA19-0.6				✓			✓
EB2316811-009	31-May-2023 00:00	CA19-1.2	✓						
EB2316811-010	01-Jun-2023 00:00	MW95-0.2				✓			✓
EB2316811-011	01-Jun-2023 00:00	MW95-1.0				✓			✓
EB2316811-012	01-Jun-2023 00:00	MW95-2.0				✓			✓
EB2316811-013	01-Jun-2023 00:00	MW95-4.0				✓			✓
EB2316811-014	01-Jun-2023 00:00	MW95-5.0	✓						
EB2316811-015	01-Jun-2023 00:00	MW95#2-2.0				✓			✓
EB2316811-016	01-Jun-2023 00:00	MW96-0.2	✓						
EB2316811-017	01-Jun-2023 00:00	MW96-1.0	✓						
EB2316811-018	01-Jun-2023 00:00	MW96-2.0	✓						
EB2316811-019	01-Jun-2023 00:00	MW96#2-0.2	✓						
EB2316811-020	01-Jun-2023 00:00	MW96#2-0.8				✓			✓
EB2316811-021	01-Jun-2023 00:00	MW96#2-2.0	✓						
EB2316811-022	01-Jun-2023 00:00	MW96#2-3.0				✓			✓
EB2316811-023	01-Jun-2023 00:00	MW96#2-4.0	✓						
EB2316811-024	01-Jun-2023 00:00	MW96#3-6.0				✓			✓
EB2316811-025	01-Jun-2023 00:00	MW97-0.2				✓			✓
EB2316811-026	01-Jun-2023 00:00	MW97-1.0	✓						
EB2316811-027	01-Jun-2023 00:00	MW97-2.0				✓			✓
EB2316811-028	01-Jun-2023 00:00	MW97-3.3		✓	✓	✓	✓	✓	✓
EB2316811-029	01-Jun-2023 00:00	BD04_0106				✓			✓
EB2316811-030	02-Jun-2023 00:00	CA-SS01				✓			✓
EB2316811-031	02-Jun-2023 00:00	CA-SS02				✓			✓
EB2316811-032	02-Jun-2023 00:00	CA-SS03				✓			✓
EB2316811-033	02-Jun-2023 00:00	CA-SS04				✓			✓

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK071G Reactive Phosphorus by Discrete analyser	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride	WATER - NT-04 Nitrite and Nitrate
EB2316811-034	02-Jun-2023 00:00	Coal Hopper	✓	✓	✓	✓	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Coal Hopper	Clear Plastic Bottle - Natural	----	04-Jun-2023	06-Jun-2023	×	----	----
EK071G: Reactive Phosphorus as P-By Discrete Analyser							
Coal Hopper	Clear Plastic Bottle - Natural	----	04-Jun-2023	06-Jun-2023	×	----	----

Requested Deliverables

CS ENERGY ENVIRONMENTAL DATA

- *AU Certificate of Analysis - NATA (COA)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	CSEnergyEnvironmentData@csenergy.com.au
- Chain of Custody (CoC) (COC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ESDAT (ESDAT)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - XTab (XTAB)	Email	CSEnergyEnvironmentData@csenergy.com.au

ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au

INVOICES

- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au

LABS

- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	labs@epicenvironmental.com.au

LUKE AMIES

- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

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Chain of Custody Record

Project No:	BC200153.03
Project/Site:	Callide A Drilling
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinzcak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	1 of 2
Number of Eskies:	4 (includes samples from separate workorder)

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 Day TAT
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE: Soil / Solid 150-250ml Glass Jar	Soil / Solid 200ml Plastic Jar	Soil / Solid - Plastic bag	Water / Liquid 2x 40ml Amber Vial	Water / Liquid 100-500ml Amber Bottle	Water / Liquid 60ml Metals	Water / Liquid 60ml Nutrients	Water / Liquid 250-500ml Plastic (Unpreserved)	Water / Liquid 60-250ml Plastic (PFAS)	Other	ANALYSIS REQUIRED: Soil PFAS (EP231X)	HOLD
1	CA17-0.2	31/05/2023	S		1									x	
2	CA17-0.7	31/05/2023	S		1									x	
3	CA17-1.4	31/05/2023	S		1										
4	CA18-0.5	31/05/2023	S		1									x	
5	CA18-1.0	31/05/2023	S		1									x	
6	CA18-1.8	31/05/2023	S		1										
7	CA19-0.2	31/05/2023	S		1									x	
8	CA19-0.6	31/05/2023	S		1									x	
9	CA19-1.2	31/05/2023	S		1										
10	MW95-0.2	1/06/2023	S		1									x	
11	MW95-1.0	1/06/2023	S		1									x	
12	MW95-2.0	1/06/2023	S		1									x	
13	MW95-4.0	1/06/2023	S		1									x	
14	MW95-5.0	1/06/2023	S		1										
15	MW95#2-2.0	1/06/2023	S		1									x	
16	MW96-0.2	1/06/2023	S		1										
17	MW96-1.0	1/06/2023	S		1										
18	MW96-2.0	1/06/2023	S		1										
19	MW96#2-0.2	1/06/2023	S		1										
20	MW96#2-0.8	1/06/2023	S		1									x	
			TOTALS		20										

Environmental Division
Brisbane
Work Order Reference
EB2316811

Telephone : 61-7-3243 7222

Relinquished By:

NAME Daniel Papinczak SIGNATURE DATE 02-Jun-23

Received By:

NAME KSchafer SIGNATURE DATE 2.6.23

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 17, 95 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email mkowalczyk@epicenvironmental.com.au
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email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

KSchafer 5.6.23 1500 Recd SW 6/6/23 11:30

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Chain of Custody Record

Project No:	BC200153.03
Project/Site:	Callide A Drilling
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinzcak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	2 of 2
Number of Eskies:	4 (includes samples from separate workorder)

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 Day TAT
Sample Disposal After:	
Note:	pH/EC analysis takes precedence over PFAS analysis

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE										ANALYSIS REQUIRED										HOLD
				Soil / Solid			Water / Liquid						Other											
				150-250ml Glass Jar	200ml Plastic Jar	- Plastic bag	2x 40ml Amber Vial	100-500ml Amber Bottle	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)		Soil PFAS (EP231X)	Soil: pH/EC	Soil: Total Organic Carbon	Soil: Fe/Mn		Water: Ionic Balace (EN055-PG)	PFAS Super Ultra Trace Long Suite (EP231X-SUT)				
21	MW96#2-2.0	1/06/2023	S		1																			
22	MW96#2-3.0	1/06/2023	S		1																			
23	MW96#2-4.0	1/06/2023	S		1									x										
24	MW96#3-6.0	1/06/2023	S		1																			
25	MW97-0.2	1/06/2023	S		1									x										
26	MW97-1.0	1/06/2023	S		1									x										
27	MW97-2.0	1/06/2023	S		1																			
28	MW97-3.3	1/06/2023	S		1									x										
29	BD04_0106	1/06/2023	S		1									x	x	x	x							
30	CA-SS01	2/06/2023	S		1									x										
31	CA-SS02	2/06/2023	S		1									x										
32	CA-SS03	2/06/2023	S		1									x										
33	CA-SS04	2/06/2023	S		1									x										
34	Coal Hopper	2/06/2023	W						1	1	1	1							x	x				
			TOTALS		12				1		1	1												

Relinquished By:					Received By:		
NAME	Daniel Papinczak	SIGNATURE		DATE 02-Jun-23	NAME KSchafer	SIGNATURE	DATE 2.6.23

Custody Seals Intact		Y	N
Samples Received Chilled		Y	N
Method of Shipment			

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
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email mkowalczyk@epicenvironmental.com.au
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email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

KSchafer 5.6.23 1500

Reid SW 6/6/23 11:30

2992

998332

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Chain of Custody Record

Project No:	BC200153.03
Project/Site:	Callide A Drilling
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinzcak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	3 of 3
Number of Eskies:	4 (includes samples from separate workorder)

Lab:	Please Send to Eurofins
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 Day TAT
Sample Disposal After:	
Note:	

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE									ANALYSIS REQUIRED											HOLD
				Soil / Solid			Water / Liquid					Other	Soil PFAS (EP231X)											
				150-250ml Glass Jar	200ml Plastic Jar	Plastic bag	2x 40ml Amber Vial	100-500ml Amber Bottle	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)												
1	SD04_0106	1/06/2023	S		1								x											
			TOTALS		1																			

Relinquished By:				Received By:	
NAME	Daniel Papinczak	SIGNATURE	DATE 02-Jun-23	NAME	SIGNATURE DATE

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 17, 95 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

Date/Time: 02/06
Chilled: Yes No
Temp:
Correction: 9.8
Final Temp:

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NATA# 1261 Site# 18217

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NZBN: 9429046024954

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Auckland 1061
Tel: +64 9 526 4551
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: +64 3 343 5201
IANZ# 1290

Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Luke Amies
Project name:	CALLIDE A DRILLING
Project ID:	BC200153.03
Turnaround time:	5 Day
Date/Time received	Jun 7, 2023 1:50 PM
Eurofins reference	998332

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Luke Amies - lamies@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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NATA# 1261 Site# 25403

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Tel: +61 2 9900 8400
NATA# 1261 Site# 18217

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NATA# 1261 Site# 25466

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NATA# 1261 Site# 20794

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NATA# 1261
Site# 25079 & 25289

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Tel: +64 9 526 4551
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: +64 3 343 5201
IANZ# 1290

Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Project Name: CALLIDE A DRILLING
Project ID: BC200153.03

Order No.: N/A
Report #: 998332
Phone: 0400 497 512
Fax:

Received: Jun 7, 2023 1:50 PM
Due: Jun 14, 2023
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SD04_0106	Jun 01, 2023		Soil	B23-Jn0028029	X	X
Test Counts						1	1

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Luke Amies**

Report **998332-S**
Project name CALLIDE A DRILLING
Project ID BC200153.03
Received Date Jun 07, 2023

Client Sample ID			**SD04_0106**
Sample Matrix			**Soil**
Eurofins Sample No.			**B23-Jn0028029**
Date Sampled			**Jun 01, 2023**
Test/Reference	LOR	Unit	
Sample Properties			
% Moisture	1	%	14
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5
13C4-PFBA (surr.)	1	%	98
13C5-PFPeA (surr.)	1	%	96
13C5-PFHxA (surr.)	1	%	89
13C4-PFHpA (surr.)	1	%	97
13C8-PFOA (surr.)	1	%	98
13C5-PFNA (surr.)	1	%	98
13C6-PFDA (surr.)	1	%	98
13C2-PFUnDA (surr.)	1	%	98
13C2-PFDoDA (surr.)	1	%	101
13C2-PFTeDA (surr.)	1	%	104
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10
13C8-FOSA (surr.)	1	%	108

Client Sample ID			SD04_0106
Sample Matrix			Soil
Eurofins Sample No.			B23-Jn0028029
Date Sampled			Jun 01, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D3-N-MeFOSA (surr.)	1	%	95
D5-N-EtFOSA (surr.)	1	%	88
D7-N-MeFOSE (surr.)	1	%	84
D9-N-EtFOSE (surr.)	1	%	88
D5-N-EtFOSAA (surr.)	1	%	100
D3-N-MeFOSAA (surr.)	1	%	104
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5
13C3-PFBS (surr.)	1	%	102
18O2-PFHxS (surr.)	1	%	107
13C8-PFOS (surr.)	1	%	100
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5
13C2-4:2 FTSA (surr.)	1	%	107
13C2-6:2 FTSA (surr.)	1	%	129
13C2-8:2 FTSA (surr.)	1	%	81
13C2-10:2 FTSA (surr.)	1	%	97
PFASs Summations			
Sum (PFHxS + PFOS)*	5	ug/kg	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Brisbane	Jun 13, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jun 16, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jun 16, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jun 16, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jun 16, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
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Project Name: CALLIDE A DRILLING
Project ID: BC200153.03

Order No.: N/A
Report #: 998332
Phone: 0400 497 512
Fax:

Received: Jun 7, 2023 1:50 PM
Due: Jun 14, 2023
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SD04_0106	Jun 01, 2023		Soil	B23-Jn0028029	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	85			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	108			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	88			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	120			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	99			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	112			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	105			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	89			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	82			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	88			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	106			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	85			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	111			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	103			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	127			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	89			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	134			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	121			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	103			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	73			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	64			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	89			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	76			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	113			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	87			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	115			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	113			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	70			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	92			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B23-Jn0034001	NCP	%	81			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Jn0034001	NCP	%	104			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Jn0034001	NCP	%	87			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Jn0034001	NCP	%	109			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B23-Jn0034001	NCP	%	100			50-150	Pass	
Perfluorononanoic acid (PFNA)	B23-Jn0034001	NCP	%	102			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B23-Jn0034001	NCP	%	104			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Jn0034001	NCP	%	86			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Jn0034001	NCP	%	82			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Jn0034001	NCP	%	80			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Jn0034001	NCP	%	102			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B23-Jn0034001	NCP	%	72			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Jn0034001	NCP	%	136			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Jn0034001	NCP	%	121			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Jn0029786	NCP	%	70			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Jn0034001	NCP	%	92			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Jn0029786	NCP	%	141			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Jn0029786	NCP	%	108			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B23-Jn0034001	NCP	%	109			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Jn0034001	NCP	%	70			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Jn0034001	NCP	%	75			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Jn0034001	NCP	%	116			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Jn0034001	NCP	%	84			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Jn0034001	NCP	%	110			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Jn0034001	NCP	%	84			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Jn0029786	NCP	%	103			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Jn0034001	NCP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Jn0034001	NCP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Jn0034001	NCP	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Jn0034001	NCP	%	90			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-Jn0028026	NCP	%	21	19	12	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Jn0038483	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Jn0038483	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Jn0038483	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Jn0038483	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2318365**	Page	: 1 of 57
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 20-Jun-2023 11:00
Order number	: ----	Date Analysis Commenced	: 20-Jun-2023
C-O-C number	: ----	Issue Date	: 29-Jun-2023 11:05
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUATERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 68		
No. of samples analysed	: 68		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Keegan Mullane	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
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General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X-SUT PFAS Super Ultra Trace: High LCS recovery deemed acceptable as all associated analyte results are less than LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- The presence of high SO4 may bias the EC low.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter on some samples, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits for some samples due to analytes not quantified in this report.
- EP231X-SUT PFAS Super Ultra Trace: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP231X-SUT PFAS Super Ultra Trace: The LOR values for particular analytes have been raised in particular samples due to matrix interference.
- It is recognised that EK059G (Nitrite + Nitrate) is less than EK057G (Nitrite) for sample some samples. However, the difference is within experimental variation of the methods.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Bore X	ESC3	ESC4	L005-B01	L006-B05
			Sampling date / time	14-Jun-2023 00:00	08-Jun-2023 00:00	12-Jun-2023 00:00	13-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-001	EB2318365-002	EB2318365-003	EB2318365-004	EB2318365-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.28	7.47	7.40	7.83	7.06
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	19900	9340	8640	2050	3200
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	15800	7360	6750	1180	2090
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	24	<1	<1	21	4
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	499	247	211	315	131
Total Alkalinity as CaCO3	----	1	mg/L	499	247	211	315	131
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2980	1660	1650	61	72
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	6200	2480	2260	474	940
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	676	437	526	115	261
Magnesium	7439-95-4	1	mg/L	1020	486	508	56	132
Sodium	7440-23-5	1	mg/L	2970	1140	864	233	161
Potassium	7440-09-7	1	mg/L	1	3	<1	3	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.116	6.89	0.547	0.008	0.006
Iron	7439-89-6	0.05	mg/L	0.38	<0.05	<0.05	0.15	1.37
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.3	1.4	0.7	0.2	0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.25	0.04	<0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	0.02	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.16	<0.01	<0.01	1.27	2.90
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Bore X	ESC3	ESC4	L005-B01	L006-B05
				Sampling date / time	14-Jun-2023 00:00	08-Jun-2023 00:00	12-Jun-2023 00:00	13-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-001	EB2318365-002	EB2318365-003	EB2318365-004	EB2318365-005
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.18**	<0.01	<0.01	**1.27**	**2.90**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	**0.02**	<0.01	**0.02**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**247**	**109**	**102**	**20.9**	**30.6**
ø Total Cations	----	0.01	meq/L		**247**	**111**	**106**	**20.6**	**30.9**
ø Ionic Balance	----	0.01	%		<0.01	**0.91**	**1.60**	**0.90**	**0.50**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0137**	**0.0115**	**0.0284**	**0.0020**	**0.0039**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0050**	**0.0078**	**0.0298**	**0.0025**	**0.0054**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0280**	**0.0423**	**0.196**	**0.0249**	**0.0405**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0010	**0.0010**	**0.0049**	**0.0008**	**0.0012**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0117**	**0.0243**	**0.0412**	**0.0606**	**0.0453**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0080	<0.0084	<0.0793	<0.0079	<0.0079
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0016	<0.0159	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0016	<0.0016	**0.0007**	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	**0.0015**	<0.0016	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Bore X	ESC3	ESC4	L005-B01	L006-B05
				Sampling date / time	14-Jun-2023 00:00	08-Jun-2023 00:00	12-Jun-2023 00:00	13-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-001	EB2318365-002	EB2318365-003	EB2318365-004	EB2318365-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0040	<0.0040	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.004	<0.004	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.004	<0.004	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.002	<0.002	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.002	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0397**	**0.0666**	**0.237**	**0.0855**	**0.0858**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0534**	**0.0781**	**0.266**	**0.0882**	**0.0897**
^ Sum of PFAS	----	0.0002	µg/L		**0.0584**	**0.0884**	**0.300**	**0.0915**	**0.0963**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**104**	**95.7**	**99.0**	**91.0**	**95.3**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Bore X	ESC3	ESC4	L005-B01	L006-B05
				Sampling date / time	14-Jun-2023 00:00	08-Jun-2023 00:00	12-Jun-2023 00:00	13-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-001	EB2318365-002	EB2318365-003	EB2318365-004	EB2318365-005
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**115**	**95.2**	**98.2**	**94.9**	**98.9**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	L012-B01	L021-B01	MW06	MW09	MW11
			Sampling date / time	14-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	08-Jun-2023 00:00	08-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-006	EB2318365-007	EB2318365-008	EB2318365-009	EB2318365-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.18	7.44	7.20	7.56	7.50
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1360	600	22700	12500	9980
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	972	344	16100	8570	7400
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	<1	32	49	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	172	133	447	472	218
Total Alkalinity as CaCO3	----	1	mg/L	172	133	447	472	218
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	85	7	2480	1690	1750
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	302	104	6630	3040	2360
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	101	35	820	309	540
Magnesium	7439-95-4	1	mg/L	50	18	1060	520	487
Sodium	7440-23-5	1	mg/L	100	60	2830	1710	993
Potassium	7440-09-7	1	mg/L	2	1	1	<1	<1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.008	<0.001	0.038	0.313	1.94
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.41	1.02	0.09
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.2	0.8	0.6
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.01	0.04	0.06	0.04
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.23	0.05	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L012-B01	L021-B01	MW06	MW09	MW11
				Sampling date / time	14-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	08-Jun-2023 00:00	08-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-006	EB2318365-007	EB2318365-008	EB2318365-009	EB2318365-010
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.23**	**0.05**	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	**0.01**	<0.01	**0.05**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**13.7**	**5.74**	**248**	**130**	**107**
ø Total Cations	----	0.01	meq/L		**13.6**	**5.86**	**251**	**132**	**110**
ø Ionic Balance	----	0.01	%		**0.62**	**1.09**	**0.74**	**0.85**	**1.31**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0015**	**0.0008**	**0.0103**	**0.0123**	**0.0123**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0014**	**0.0011**	**0.0037**	**0.0073**	**0.0068**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0165**	**0.0124**	**0.0211**	**0.0405**	**0.0409**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0005**	<0.0005	<0.0005	**0.0011**	**0.0009**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0092**	**0.0456**	**0.0092**	**0.0434**	**0.0184**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0079	<0.0020	<0.0079	<0.0079	<0.0079
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0005	<0.0016	<0.0016	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L012-B01	L021-B01	MW06	MW09	MW11
				Sampling date / time	14-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	08-Jun-2023 00:00	08-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-006	EB2318365-007	EB2318365-008	EB2318365-009	EB2318365-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0040	<0.0039	<0.0039
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.001	<0.001	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0257**	**0.0580**	**0.0303**	**0.0839**	**0.0593**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0272**	**0.0588**	**0.0406**	**0.0962**	**0.0716**
^ Sum of PFAS	----	0.0002	µg/L		**0.0291**	**0.0599**	**0.0443**	**0.105**	**0.0793**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**96.2**	**88.5**	**102**	**91.1**	**93.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L012-B01	L021-B01	MW06	MW09	MW11
				Sampling date / time	14-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	08-Jun-2023 00:00	08-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-006	EB2318365-007	EB2318365-008	EB2318365-009	EB2318365-010
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**100**	**98.5**	**107**	**94.5**	**96.3**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW26	MW27	MW31	MW32	MW40
			Sampling date / time	14-Jun-2023 00:00	14-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00	12-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-011	EB2318365-012	EB2318365-013	EB2318365-014	EB2318365-015
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.48	7.40	7.65	7.00	7.35
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	10200	22800	3430	7010	8990
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	6500	14700	2040	4860	6040
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	1	10	2	<1	55
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	477	902	550	474	673
Total Alkalinity as CaCO3	----	1	mg/L	477	902	550	474	673
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	776	1020	13	950	676
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2770	6980	867	1660	2380
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	293	270	76	505	238
Magnesium	7439-95-4	1	mg/L	373	834	172	510	482
Sodium	7440-23-5	1	mg/L	1320	3530	410	287	980
Potassium	7440-09-7	1	mg/L	1	3	<1	<1	<1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.134	0.370	0.382	0.780	0.539
Iron	7439-89-6	0.05	mg/L	0.08	0.11	0.16	0.25	0.20
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.3	0.8	0.9	0.6	0.6
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.25	<0.01	0.03	0.06	0.05
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	0.03	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.77	<0.01	0.01	<0.01	0.10
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW26	MW27	MW31	MW32	MW40
				Sampling date / time	14-Jun-2023 00:00	14-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00	12-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-011	EB2318365-012	EB2318365-013	EB2318365-014	EB2318365-015
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.80**	<0.01	**0.01**	<0.01	**0.10**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.38**	**0.04**	**0.04**	<0.01	**0.04**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**104**	**236**	**35.7**	**76.1**	**94.6**
ø Total Cations	----	0.01	meq/L		**103**	**236**	**35.8**	**79.6**	**94.2**
ø Ionic Balance	----	0.01	%		**0.51**	**0.09**	**0.09**	**2.30**	**0.26**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0034**	**0.0205**	<0.0005	**0.535**	**0.0428**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	**0.0076**	<0.0005	**0.955**	**0.0306**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0039**	**0.0298**	<0.0005	**4.34**	**0.203**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**0.162**	**0.0120**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0089**	**0.0022**	**0.0007**	**0.928**	**0.302**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0031
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0080	<0.0080	<0.0079	**0.215**	<0.0157
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0093**	<0.0005	<0.0016	**0.286**	<0.0031
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0094**	<0.0005	<0.0005	**0.157**	<0.0315
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0054**	<0.0016	<0.0016	**1.11**	<0.0031
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0009**	<0.0005	<0.0005	**0.212**	<0.0031
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0031
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0031
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0031
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0031
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0031

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW26	MW27	MW31	MW32	MW40
				Sampling date / time	14-Jun-2023 00:00	14-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00	12-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-011	EB2318365-012	EB2318365-013	EB2318365-014	EB2318365-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0081	<0.0079
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0031
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.001	<0.004	<0.081	<0.008
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.001	<0.004	<0.008	<0.008
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.008	<0.008
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.008	<0.008
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0031
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0031
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.003	<0.003
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	**0.003**	<0.001	**0.011**	**0.022**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.003	<0.003
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.003	<0.003
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0128**	**0.0320**	**0.0007**	**5.27**	**0.505**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0412**	**0.0555**	**0.0007**	**7.79**	**0.570**
^ Sum of PFAS	----	0.0002	µg/L		**0.0412**	**0.0631**	**0.0007**	**8.91**	**0.612**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**92.1**	**92.6**	**94.4**	**96.9**	**99.7**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW26	MW27	MW31	MW32	MW40
				Sampling date / time	14-Jun-2023 00:00	14-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00	12-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-011	EB2318365-012	EB2318365-013	EB2318365-014	EB2318365-015
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**98.7**	**102**	**93.4**	**98.5**	**96.2**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW42	MW43	MW49	MW59	MW60
			Sampling date / time	12-Jun-2023 00:00	09-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	14-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-016	EB2318365-017	EB2318365-018	EB2318365-019	EB2318365-020
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.44	7.19	7.22	7.68	7.13
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	10600	7630	16000	11700	26200
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	7330	5900	10800	6780	19900
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	2	26	6	30	125
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	332	502	690	841	534
Total Alkalinity as CaCO3	----	1	mg/L	332	502	690	841	534
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1510	1180	897	676	3120
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2650	1760	4960	3160	7850
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	294	398	491	74	721
Magnesium	7439-95-4	1	mg/L	444	649	645	265	1260
Sodium	7440-23-5	1	mg/L	1370	398	2060	2010	3520
Potassium	7440-09-7	1	mg/L	1	1	4	<1	3
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	3.77	0.185	2.51	0.010	0.042
Iron	7439-89-6	0.05	mg/L	<0.05	1.03	2.72	0.30	0.17
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.4	0.4	0.5	0.7	0.4
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.06	0.05	<0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.60	4.54
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW42	MW43	MW49	MW59	MW60
				Sampling date / time	12-Jun-2023 00:00	09-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	14-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-016	EB2318365-017	EB2318365-018	EB2318365-019	EB2318365-020
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	**0.60**	**4.54**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	<0.01	<0.01	**0.04**	**0.02**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**113**	**84.2**	**172**	**120**	**297**
ø Total Cations	----	0.01	meq/L		**111**	**90.6**	**167**	**113**	**293**
ø Ionic Balance	----	0.01	%		**0.89**	**3.64**	**1.50**	**3.04**	**0.71**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0134**	**0.327**	**0.119**	**0.0450**	**0.0206**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0068**	**0.405**	**0.181**	**0.0412**	**0.0123**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0383**	**1.73**	**2.13**	**0.230**	**0.0616**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0015	**0.0267**	**0.0276**	**0.0126**	<0.0031
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0301**	**0.0780**	**0.414**	**0.0731**	<0.0031
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0031	<0.0031	<0.0005	<0.0031
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0084	**0.142**	**0.0519**	**0.0381**	**0.0255**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	**0.116**	**0.0130**	**0.0102**	**0.0080**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	**0.0428**	**0.0031**	**0.0042**	<0.0031
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0017	**0.396**	**0.0289**	**0.0396**	**0.0156**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	**0.0362**	**0.0046**	**0.0101**	<0.0031
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0031	<0.0031	<0.0005	<0.0031
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0031	<0.0031	<0.0005	<0.0031
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0031	<0.0031	<0.0005	<0.0031
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0031	<0.0031	<0.0005	<0.0031
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0031	<0.0031	<0.0005	<0.0031

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW42	MW43	MW49	MW59	MW60
				Sampling date / time	12-Jun-2023 00:00	09-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	14-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-016	EB2318365-017	EB2318365-018	EB2318365-019	EB2318365-020
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0042	<0.0079	<0.0078	<0.0005	<0.0077
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0031	<0.0031	<0.0005	<0.0031
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.008	<0.008	<0.001	<0.008
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.008	<0.008	<0.001	<0.008
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.008	<0.008	<0.001	<0.008
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.008	<0.008	<0.001	<0.008
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0031	<0.0031	<0.0005	<0.0031
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0031	<0.0031	<0.0005	<0.0031
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.003	<0.003	<0.001	<0.003
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.003	**0.013**	<0.001	<0.003
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.003	<0.003	<0.001	<0.003
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.003	<0.003	<0.001	<0.003
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0684**	**1.81**	**2.54**	**0.303**	**0.0616**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0818**	**2.87**	**2.78**	**0.450**	**0.131**
^ Sum of PFAS	----	0.0002	µg/L		**0.0886**	**3.30**	**2.99**	**0.504**	**0.144**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**106**	**104**	**97.7**	**96.3**	**99.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW42	MW43	MW49	MW59	MW60
				Sampling date / time	12-Jun-2023 00:00	09-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	14-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-016	EB2318365-017	EB2318365-018	EB2318365-019	EB2318365-020
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**117**	**98.3**	**97.4**	**99.0**	**97.5**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW68	MW69	MW70	MW72	MW73
			Sampling date / time	07-Jun-2023 00:00	13-Jun-2023 00:00	13-Jun-2023 00:00	07-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-021	EB2318365-022	EB2318365-023	EB2318365-024	EB2318365-025
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.32	7.17	7.17	7.34	6.87
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	9150	1090	780	902	2270
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	6240	782	526	584	1750
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	13	1	<1	<1	12
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	647	194	155	190	215
Total Alkalinity as CaCO3	----	1	mg/L	647	194	155	190	215
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	704	68	43	48	124
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2510	229	135	171	644
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	263	89	56	68	214
Magnesium	7439-95-4	1	mg/L	387	40	27	34	104
Sodium	7440-23-5	1	mg/L	1150	84	64	69	119
Potassium	7440-09-7	1	mg/L	1	2	2	5	4
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.312	0.032	0.334	0.785	0.103
Iron	7439-89-6	0.05	mg/L	0.73	0.07	<0.05	<0.05	1.32
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.5	<0.1	0.1	0.1	<0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	<0.01	0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.01	0.04	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW68	MW69	MW70	MW72	MW73
				Sampling date / time	07-Jun-2023 00:00	13-Jun-2023 00:00	13-Jun-2023 00:00	07-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-021	EB2318365-022	EB2318365-023	EB2318365-024	EB2318365-025
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.01**	**0.04**	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.05**	**0.01**	**0.01**	**0.01**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**98.4**	**11.8**	**7.80**	**9.62**	**25.0**
ø Total Cations	----	0.01	meq/L		**95.0**	**11.4**	**7.85**	**9.32**	**24.5**
ø Ionic Balance	----	0.01	%		**1.74**	**1.35**	**0.33**	**1.58**	**1.06**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0478**	**0.0023**	**0.0019**	<0.0016	**0.0074**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0404**	**0.0011**	**0.0011**	<0.0005	**0.0075**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.247**	**0.0105**	**0.0153**	**0.0034**	**0.0591**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0111**	<0.0005	**0.0007**	<0.0005	**0.0020**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.337**	**0.0342**	**0.0543**	**0.0074**	**0.0823**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0796	<0.0078	<0.0079	<0.0079	<0.0078
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0027**	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW68	MW69	MW70	MW72	MW73
				Sampling date / time	07-Jun-2023 00:00	13-Jun-2023 00:00	13-Jun-2023 00:00	07-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-021	EB2318365-022	EB2318365-023	EB2318365-024	EB2318365-025
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0039	<0.0040	<0.0039	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.002	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.002	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.002	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.002	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.584**	**0.0447**	**0.0696**	**0.0108**	**0.141**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.634**	**0.0470**	**0.0715**	**0.0108**	**0.149**
^ Sum of PFAS	----	0.0002	µg/L		**0.686**	**0.0481**	**0.0733**	**0.0108**	**0.158**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**95.4**	**95.0**	**92.9**	**94.7**	**95.1**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW68	MW69	MW70	MW72	MW73
				Sampling date / time	07-Jun-2023 00:00	13-Jun-2023 00:00	13-Jun-2023 00:00	07-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-021	EB2318365-022	EB2318365-023	EB2318365-024	EB2318365-025
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**94.3**	**93.0**	**91.4**	**95.8**	**98.7**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW74	MW75	MW76	MW78	MW79
			Sampling date / time	12-Jun-2023 00:00	13-Jun-2023 00:00	13-Jun-2023 00:00	08-Jun-2023 00:00	13-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-026	EB2318365-027	EB2318365-028	EB2318365-029	EB2318365-030
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.47	7.21	8.01	7.61	7.19
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	3640	21400	8750	11100	7910
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	2450	13900	7340	7340	6040
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	18	4	627	<1	30
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	880	981	126	617	406
Total Alkalinity as CaCO3	----	1	mg/L	880	981	126	617	406
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	500	389	2370	1500	251
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	562	6980	1860	2720	2680
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	90	254	768	110	648
Magnesium	7439-95-4	1	mg/L	106	628	381	306	498
Sodium	7440-23-5	1	mg/L	657	3750	862	1980	314
Potassium	7440-09-7	1	mg/L	7	3	20	2	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.037	0.591	1.65	0.070	2.88
Iron	7439-89-6	0.05	mg/L	0.90	0.18	10.5	<0.05	3.38
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.0	0.3	9.4	1.1	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.05	0.27	<0.01	0.09
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.02
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.01	0.02	<0.01	0.52
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW74	MW75	MW76	MW78	MW79
				Sampling date / time	12-Jun-2023 00:00	13-Jun-2023 00:00	13-Jun-2023 00:00	08-Jun-2023 00:00	13-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-026	EB2318365-027	EB2318365-028	EB2318365-029	EB2318365-030
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**0.01**	**0.02**	<0.01	**0.54**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.13**	**0.01**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**43.8**	**224**	**104**	**120**	**88.9**
ø Total Cations	----	0.01	meq/L		**42.0**	**228**	**108**	**117**	**87.0**
ø Ionic Balance	----	0.01	%		**2.18**	**0.65**	**1.58**	**1.45**	**1.08**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.192**	<0.0085	**0.0012**	**0.0212**	**0.0112**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.101**	**0.0018**	<0.0005	**0.0092**	**0.0078**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.364**	**0.0092**	<0.0005	**0.0411**	**0.0360**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0029**	<0.0005	<0.0005	**0.0011**	<0.0031
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0150**	**0.0030**	<0.0008	**0.0310**	<0.0031
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0031
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.890**	<0.0078	**0.0393**	<0.0077	<0.0155
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**2.19**	<0.0016	**0.0008**	<0.0015	**0.0053**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.153**	**0.0016**	<0.0005	<0.0015	<0.0031
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.788**	**0.0030**	**0.0006**	<0.0015	<0.0031
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0128**	<0.0016	<0.0005	<0.0015	<0.0031
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0015	<0.0031
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0031
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0031
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0015	<0.0031
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0015	<0.0031

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW74	MW75	MW76	MW78	MW79
				Sampling date / time	12-Jun-2023 00:00	13-Jun-2023 00:00	13-Jun-2023 00:00	08-Jun-2023 00:00	13-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-026	EB2318365-027	EB2318365-028	EB2318365-029	EB2318365-030
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0038	<0.0078
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0015	<0.0031
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.004	<0.008
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.004	<0.008
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.004	<0.008
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.004	<0.008
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0031
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0031
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.003
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.002**	**0.026**	<0.001	<0.001	<0.003
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.003
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.003
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.379**	**0.0122**	<0.0002	**0.0721**	**0.0360**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**4.61**	**0.0428**	**0.0419**	**0.0933**	**0.0525**
^ Sum of PFAS	----	0.0002	µg/L		**4.71**	**0.0446**	**0.0419**	**0.104**	**0.0603**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**90.5**	**91.0**	**92.0**	**86.5**	**91.3**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW74	MW75	MW76	MW78	MW79
				Sampling date / time	12-Jun-2023 00:00	13-Jun-2023 00:00	13-Jun-2023 00:00	08-Jun-2023 00:00	13-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-026	EB2318365-027	EB2318365-028	EB2318365-029	EB2318365-030
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**102**	**88.0**	**91.0**	**93.1**	**94.9**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW80	MW97	RN13030126	RN13030127	RN13030692
			Sampling date / time	06-Jun-2023 00:00	14-Jun-2023 00:00	10-Jun-2023 00:00	10-Jun-2023 00:00	09-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-031	EB2318365-032	EB2318365-033	EB2318365-034	EB2318365-035
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.47**	**7.92**	**7.17**	**7.07**	**7.17**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**2140**	**622**	**566**	**809**	**507**
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**1480**	**498**	**346**	**558**	**298**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	**17**	**2700**	<1	**4080**	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**178**	**331**	**148**	**158**	**142**
Total Alkalinity as CaCO3	----	1	mg/L	**178**	**331**	**148**	**158**	**142**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**270**	**21**	**14**	**12**	**18**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**504**	**11**	**94**	**215**	**70**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**93**	**22**	**41**	**41**	**34**
Magnesium	7439-95-4	1	mg/L	**70**	**30**	**17**	**29**	**15**
Sodium	7440-23-5	1	mg/L	**238**	**80**	**52**	**63**	**51**
Potassium	7440-09-7	1	mg/L	**14**	<1	**1**	**1**	**1**
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	**0.787**	**3.20**	**0.002**	**3.19**	<0.001
Iron	7439-89-6	0.05	mg/L	**1.64**	**40.7**	<0.05	**194**	<0.05
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.1**	**1.9**	**0.1**	**0.3**	**0.1**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.17**	<0.01	<0.01	**0.14**	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.09**	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	**0.07**	**0.03**	**0.10**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW80	MW97	RN13030126	RN13030127	RN13030692
				Sampling date / time	06-Jun-2023 00:00	14-Jun-2023 00:00	10-Jun-2023 00:00	10-Jun-2023 00:00	09-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-031	EB2318365-032	EB2318365-033	EB2318365-034	EB2318365-035
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.05**	<0.01	**0.07**	**0.03**	**0.10**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.12**	**0.02**	<0.01	**0.02**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**23.4**	**7.36**	**5.90**	**9.47**	**5.19**
ø Total Cations	----	0.01	meq/L		**21.1**	**7.05**	**5.73**	**7.20**	**5.18**
ø Ionic Balance	----	0.01	%		**5.13**	**2.18**	**1.44**	**13.6**	**0.11**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0040**	<0.0355	**0.0013**	<0.0215	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0046**	**0.0030**	**0.0014**	**0.0046**	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0095**	**0.0108**	**0.0109**	**0.0532**	**0.0063**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	**0.0005**	<0.0005	**0.0011**	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	**0.0117**	**0.0068**	**0.0130**	**0.0159**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0078	<0.0078	<0.0078	<0.0078	<0.0078
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0016	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0016	<0.0005	**0.0009**	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0005	<0.0005	**0.0005**	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW80	MW97	RN13030126	RN13030127	RN13030692
				Sampling date / time	06-Jun-2023 00:00	14-Jun-2023 00:00	10-Jun-2023 00:00	10-Jun-2023 00:00	09-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-031	EB2318365-032	EB2318365-033	EB2318365-034	EB2318365-035
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0039	<0.0005	<0.0039	<0.0005	<0.0039
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0016	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.001	<0.001	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.001	<0.001	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.001	<0.001	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	**0.037**	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0095**	**0.0225**	**0.0177**	**0.0662**	**0.0222**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0135**	**0.0225**	**0.0190**	**0.105**	**0.0222**
^ Sum of PFAS	----	0.0002	µg/L		**0.0181**	**0.0260**	**0.0204**	**0.110**	**0.0222**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**89.1**	**94.7**	**96.4**	**87.8**	**91.2**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW80	MW97	RN13030126	RN13030127	RN13030692
				Sampling date / time	06-Jun-2023 00:00	14-Jun-2023 00:00	10-Jun-2023 00:00	10-Jun-2023 00:00	09-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-031	EB2318365-032	EB2318365-033	EB2318365-034	EB2318365-035
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**93.6**	**94.3**	**92.8**	**92.0**	**94.6**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	RN13030697	RN13030698	RN13030715	DRD	Notch-V1
			Sampling date / time	10-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00	06-Jun-2023 00:00	08-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-036	EB2318365-037	EB2318365-038	EB2318365-039	EB2318365-040
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.54	7.14	7.87	7.87	7.94
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1220	2320	2850	6620	18400
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	835	1700	1900	5240	14400
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	1210	<1	<1	30	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	281	301	314	118	456
Total Alkalinity as CaCO3	----	1	mg/L	281	301	314	118	456
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	12	42	57	1240	2340
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	268	656	757	1440	5510
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	101	189	159	394	574
Magnesium	7439-95-4	1	mg/L	24	84	85	213	848
Sodium	7440-23-5	1	mg/L	118	197	299	708	2610
Potassium	7440-09-7	1	mg/L	7	2	1	24	3
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	5.00	<0.001	<0.001	0.394	1.87
Iron	7439-89-6	0.05	mg/L	23.7	<0.05	<0.05	0.37	0.09
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.2	1.1	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	1.42	<0.01	<0.01	0.05	0.17
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.86	10.9	4.45	0.24	0.02
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030697	RN13030698	RN13030715	DRD	Notch-V1
				Sampling date / time	10-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00	06-Jun-2023 00:00	08-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-036	EB2318365-037	EB2318365-038	EB2318365-039	EB2318365-040
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.86**	**10.9**	**4.45**	**0.24**	**0.02**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.54**	**0.03**	**0.10**	**0.06**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**13.4**	**25.4**	**28.8**	**68.8**	**213**
ø Total Cations	----	0.01	meq/L		**12.3**	**25.0**	**28.0**	**68.6**	**212**
ø Ionic Balance	----	0.01	%		**4.26**	**0.85**	**1.50**	**0.14**	**0.29**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0123**	**0.0038**	**0.0017**	**0.0067**	**0.0146**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0100**	**0.0035**	**0.0010**	**0.0022**	<0.0090
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.102**	**0.0352**	**0.0048**	**0.0232**	**0.0299**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0038**	<0.0005	<0.0005	<0.0016	<0.0032
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0570**	**0.0034**	<0.0002	**0.0214**	**0.0143**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0032
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0078	<0.0079	<0.0080	<0.0800	<0.159
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0040**	<0.0016	<0.0005	<0.0160	<0.0032
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0032
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0025**	<0.0005	<0.0005	<0.0160	<0.0032
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**0.0024**	<0.0032
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0032
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0032
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0032
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0016	<0.0032
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0016	<0.0032

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030697	RN13030698	RN13030715	DRD	Notch-V1
				Sampling date / time	10-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00	06-Jun-2023 00:00	08-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-036	EB2318365-037	EB2318365-038	EB2318365-039	EB2318365-040
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0400	<0.0080
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0032
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.001	<0.001	<0.040	<0.008
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.001	<0.001	<0.040	<0.008
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.001	<0.001	<0.004	<0.008
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.001	<0.001	<0.040	<0.008
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0016	<0.0032
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0032
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.003
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.002**	<0.001	<0.001	<0.002	<0.003
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.003
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.003
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.159**	**0.0386**	**0.0048**	**0.0446**	**0.0442**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.180**	**0.0424**	**0.0065**	**0.0537**	**0.0588**
^ Sum of PFAS	----	0.0002	µg/L		**0.194**	**0.0459**	**0.0075**	**0.0559**	**0.0588**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**85.8**	**83.7**	**93.9**	**92.9**	**99.1**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030697	RN13030698	RN13030715	DRD	Notch-V1
				Sampling date / time	10-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00	06-Jun-2023 00:00	08-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-036	EB2318365-037	EB2318365-038	EB2318365-039	EB2318365-040
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**96.5**	**91.1**	**90.9**	**106**	**102**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	Notch-V2	PW1	PW2	SW02	SW12
			Sampling date / time	08-Jun-2023 00:00	12-Jun-2023 00:00	06-Jun-2023 00:00	12-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-041	EB2318365-042	EB2318365-043	EB2318365-044	EB2318365-045
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.14	7.87	7.97	7.77	7.79
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	18100	8040	10700	539	480
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	13400	6000	8430	329	299
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	12	8	3	4
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	451	125	102	147	142
Total Alkalinity as CaCO3	----	1	mg/L	451	125	102	147	142
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2340	1580	2130	17	11
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	5410	1760	2700	72	58
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	493	482	603	34	31
Magnesium	7439-95-4	1	mg/L	761	267	370	18	17
Sodium	7440-23-5	1	mg/L	2580	857	1170	48	42
Potassium	7440-09-7	1	mg/L	3	25	26	4	4
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.065	0.235	0.034	0.129	0.222
Iron	7439-89-6	0.05	mg/L	0.09	0.32	0.12	0.12	0.13
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2	1.2	1.4	0.2	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.14	<0.01	0.10	0.10
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.03	<0.01	0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	0.12	<0.01	0.04	0.02
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Notch-V2	PW1	PW2	SW02	SW12
				Sampling date / time	08-Jun-2023 00:00	12-Jun-2023 00:00	06-Jun-2023 00:00	12-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-041	EB2318365-042	EB2318365-043	EB2318365-044	EB2318365-045
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.02**	**0.15**	<0.01	**0.05**	**0.02**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	**0.01**	**0.02**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**210**	**85.0**	**122**	**5.32**	**4.70**
ø Total Cations	----	0.01	meq/L		**200**	**83.9**	**112**	**5.37**	**4.88**
ø Ionic Balance	----	0.01	%		**2.64**	**0.65**	**4.45**	**0.43**	**1.81**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0144**	**0.0123**	**0.0153**	**0.0058**	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0080	**0.0043**	**0.0064**	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0371**	**0.0289**	**0.0459**	**0.0019**	<0.0012
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0032	<0.0016	<0.0032	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0160**	**0.0161**	**0.0210**	**0.0004**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0032	<0.0016	<0.0032	<0.0005	<0.0008
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.160	<0.0798	<0.159	<0.0078	<0.0078
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0032	<0.0160	<0.0032	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0032	**0.0152**	**0.0073**	<0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0032	<0.0160	**0.0083**	<0.0016	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0032	<0.0016	**0.0032**	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0032	<0.0016	<0.0032	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0032	<0.0016	<0.0032	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0032	<0.0016	<0.0032	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0032	<0.0016	<0.0032	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0032	<0.0016	<0.0032	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Notch-V2	PW1	PW2	SW02	SW12
				Sampling date / time	08-Jun-2023 00:00	12-Jun-2023 00:00	06-Jun-2023 00:00	12-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-041	EB2318365-042	EB2318365-043	EB2318365-044	EB2318365-045
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0080	<0.0399	<0.0080	<0.0039	<0.0039
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0032	<0.0016	<0.0032	<0.0016	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.008	<0.040	<0.008	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.008	<0.040	<0.008	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.008	<0.004	<0.008	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.008	<0.040	<0.008	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0032	<0.0016	<0.0032	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0032	<0.0016	<0.0032	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.003	<0.002	<0.003	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.003	<0.002	<0.003	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.003	<0.002	<0.003	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.003	<0.002	<0.003	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0531**	**0.0450**	**0.0669**	**0.0023**	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0675**	**0.0725**	**0.101**	**0.0081**	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		**0.0675**	**0.0768**	**0.107**	**0.0081**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**91.4**	**92.0**	**92.0**	**99.3**	**98.7**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Notch-V2	PW1	PW2	SW02	SW12
				Sampling date / time	08-Jun-2023 00:00	12-Jun-2023 00:00	06-Jun-2023 00:00	12-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-041	EB2318365-042	EB2318365-043	EB2318365-044	EB2318365-045
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**94.1**	**99.1**	**102**	**99.8**	**104**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SW20	SW22	SW36	SW40	SW41
			Sampling date / time	10-Jun-2023 00:00	07-Jun-2023 00:00	10-Jun-2023 00:00	07-Jun-2023 00:00	12-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-046	EB2318365-047	EB2318365-048	EB2318365-049	EB2318365-050
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.11	7.70	8.14	7.78	7.99
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	430	1220	438	1030	1020
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	272	839	278	633	625
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	16	102	8	6	11
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	138	175	141	218	226
Total Alkalinity as CaCO3	----	1	mg/L	138	175	141	218	226
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	5	31	5	15	10
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	48	292	49	208	209
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	27	64	29	69	68
Magnesium	7439-95-4	1	mg/L	15	50	15	29	30
Sodium	7440-23-5	1	mg/L	35	82	36	96	98
Potassium	7440-09-7	1	mg/L	4	12	4	2	6
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.076	0.503	0.092	0.060	0.269
Iron	7439-89-6	0.05	mg/L	0.25	0.24	0.34	0.16	0.18
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2	0.1	0.2	0.2	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.02	<0.01	0.02	0.15
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.06	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.03	0.04
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW20	SW22	SW36	SW40	SW41
				Sampling date / time	10-Jun-2023 00:00	07-Jun-2023 00:00	10-Jun-2023 00:00	07-Jun-2023 00:00	12-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-046	EB2318365-047	EB2318365-048	EB2318365-049	EB2318365-050
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	**0.03**	**0.04**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.01**	<0.01	**0.01**	**0.09**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**4.22**	**12.4**	**4.30**	**10.5**	**10.6**
ø Total Cations	----	0.01	meq/L		**4.21**	**11.2**	**4.35**	**10.0**	**10.3**
ø Ionic Balance	----	0.01	%		**0.10**	**5.08**	**0.54**	**2.32**	**1.63**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0029**	<0.0005	**0.0026**	**0.0036**	**0.0021**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	**0.0011**	<0.0005	**0.0025**	**0.0022**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	**0.0163**	<0.0005	**0.0267**	**0.0230**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**0.0013**	**0.0011**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	**0.0134**	<0.0002	**0.0216**	**0.0217**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0078	<0.0078	<0.0078	<0.0078	<0.0078
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0016
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW20	SW22	SW36	SW40	SW41
				Sampling date / time	10-Jun-2023 00:00	07-Jun-2023 00:00	10-Jun-2023 00:00	07-Jun-2023 00:00	12-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-046	EB2318365-047	EB2318365-048	EB2318365-049	EB2318365-050
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0039	<0.0039	<0.0039	<0.0039	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.004	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	**0.0297**	<0.0002	**0.0483**	**0.0447**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0029**	**0.0297**	**0.0026**	**0.0519**	**0.0468**
^ Sum of PFAS	----	0.0002	µg/L		**0.0029**	**0.0308**	**0.0026**	**0.0557**	**0.0501**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**89.3**	**96.4**	**99.5**	**104**	**92.2**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW20	SW22	SW36	SW40	SW41
				Sampling date / time	10-Jun-2023 00:00	07-Jun-2023 00:00	10-Jun-2023 00:00	07-Jun-2023 00:00	12-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-046	EB2318365-047	EB2318365-048	EB2318365-049	EB2318365-050
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**102**	**102**	**104**	**119**	**97.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB01_0706	RB01_0906	RB01_1206	RB01_1306	FB01_0706
				Sampling date / time	07-Jun-2023 00:00	09-Jun-2023 00:00	12-Jun-2023 00:00	13-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-051	EB2318365-052	EB2318365-053	EB2318365-054	EB2318365-055
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB01_0706	RB01_0906	RB01_1206	RB01_1306	FB01_0706
				Sampling date / time	07-Jun-2023 00:00	09-Jun-2023 00:00	12-Jun-2023 00:00	13-Jun-2023 00:00	07-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-051	EB2318365-052	EB2318365-053	EB2318365-054	EB2318365-055
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ **Sum of PFAS**	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**91.6**	**98.1**	**94.9**	**98.0**	**112**
13C8-PFOA	----	0.0005	%		**100**	**107**	**102**	**98.4**	**114**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	FB01_0906	FB01_1206	FB01_1306	BD01_0906	BD02_1006
			Sampling date / time	09-Jun-2023 00:00	12-Jun-2023 00:00	13-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-056	EB2318365-057	EB2318365-058	EB2318365-059	EB2318365-060
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	----	----	----	7.45	8.27
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	----	2480	425
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	----	----	----	1710	276
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	----	----	----	<1	10
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	----	----	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	----	----	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	----	----	----	291	138
Total Alkalinity as CaCO3	----	1	mg/L	----	----	----	291	138
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	----	----	43	8
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	----	----	----	653	54
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	----	----	----	186	29
Magnesium	7439-95-4	1	mg/L	----	----	----	82	16
Sodium	7440-23-5	1	mg/L	----	----	----	191	37
Potassium	7440-09-7	1	mg/L	----	----	----	2	4
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	----	----	----	<0.001	0.070
Iron	7439-89-6	0.05	mg/L	----	----	----	<0.05	0.17
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	----	----	----	0.1	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	----	----	----	<0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	----	----	----	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	----	----	----	11.0	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB01_0906	FB01_1206	FB01_1306	BD01_0906	BD02_1006
				Sampling date / time	09-Jun-2023 00:00	12-Jun-2023 00:00	13-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-056	EB2318365-057	EB2318365-058	EB2318365-059	EB2318365-060
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		----	----	----	**11.0**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	----	----	**0.03**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	----	----	**25.1**	**4.45**
ø Total Cations	----	0.01	meq/L		----	----	----	**24.4**	**4.48**
ø Ionic Balance	----	0.01	%		----	----	----	**1.49**	**0.32**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**0.0030**	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**0.0031**	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**0.0320**	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**0.0005**	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0045	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0020	<0.0081	<0.0082
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB01_0906	FB01_1206	FB01_1306	BD01_0906	BD02_1006
				Sampling date / time	09-Jun-2023 00:00	12-Jun-2023 00:00	13-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-056	EB2318365-057	EB2318365-058	EB2318365-059	EB2318365-060
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	**0.0320**	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	**0.0350**	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	**0.0386**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**88.1**	**101**	**113**	**103**	**113**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB01_0906	FB01_1206	FB01_1306	BD01_0906	BD02_1006
				Sampling date / time	09-Jun-2023 00:00	12-Jun-2023 00:00	13-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-056	EB2318365-057	EB2318365-058	EB2318365-059	EB2318365-060
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**94.4**	**98.6**	**103**	**99.5**	**102**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BD03_1006	BD04_1206	BD05_1406	SD01_0906	SD02_1006
			Sampling date / time	10-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00
Compound	CAS Number	LOR	Unit	EB2318365-061	EB2318365-062	EB2318365-063	EB2318365-064	EB2318365-065
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.61	7.49	7.69	7.17	8.37
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	2750	566	1290	2430	418
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	1910	347	965	1770	279
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	<1	2	<1	12
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	314	132	177	297	140
Total Alkalinity as CaCO3	----	1	mg/L	314	132	177	297	140
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	63	8	90	44	6
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	746	108	302	651	54
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	157	35	102	186	29
Magnesium	7439-95-4	1	mg/L	82	16	48	85	15
Sodium	7440-23-5	1	mg/L	299	58	99	195	37
Potassium	7440-09-7	1	mg/L	1	1	1	2	4
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.001	0.002	0.008	0.002	0.077
Iron	7439-89-6	0.05	mg/L	<0.05	0.08	<0.05	<0.05	0.19
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.2	0.1	0.1	0.1	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	4.46	0.23	11.1	11.2	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD03_1006	BD04_1206	BD05_1406	SD01_0906	SD02_1006
				Sampling date / time	10-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-061	EB2318365-062	EB2318365-063	EB2318365-064	EB2318365-065
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**4.46**	**0.23**	**11.1**	**11.2**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.09**	<0.01	**0.01**	**0.03**	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**28.6**	**5.85**	**13.9**	**25.2**	**4.44**
ø Total Cations	----	0.01	meq/L		**27.6**	**5.61**	**13.4**	**24.8**	**4.39**
ø Ionic Balance	----	0.01	%		**1.80**	**2.08**	**2.04**	**0.81**	**0.59**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0015**	**0.0008**	**0.0014**	**0.0028**	<0.0016
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0010**	**0.0011**	<0.0011	**0.0035**	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0046**	**0.0140**	**0.0146**	**0.0312**	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0008	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	**0.0366**	**0.0112**	<0.0044	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0080	<0.0080	<0.0080
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD03_1006	BD04_1206	BD05_1406	SD01_0906	SD02_1006
				Sampling date / time	10-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-061	EB2318365-062	EB2318365-063	EB2318365-064	EB2318365-065
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0046**	**0.0506**	**0.0258**	**0.0312**	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0061**	**0.0514**	**0.0272**	**0.0340**	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		**0.0071**	**0.0525**	**0.0272**	**0.0375**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**105**	**104**	**107**	**113**	**96.2**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD03_1006	BD04_1206	BD05_1406	SD01_0906	SD02_1006
				Sampling date / time	10-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	09-Jun-2023 00:00	10-Jun-2023 00:00
Compound	CAS Number	LOR	Unit		EB2318365-061	EB2318365-062	EB2318365-063	EB2318365-064	EB2318365-065
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**100**	**100**	**102**	**100**	**101**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SD03_1006	SD04_1206	SD05_1406	----	----
			Sampling date / time	10-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2318365-066	EB2318365-067	EB2318365-068	--------	--------
				Result	Result	Result	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**8.15**	**7.87**	**7.05**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**2760**	**573**	**1290**	**----**	**----**
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**1920**	**350**	**986**	**----**	**----**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	<1	<1	**----**	**----**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	**----**	**----**
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	**----**	**----**
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**319**	**134**	**174**	**----**	**----**
Total Alkalinity as CaCO3	----	1	mg/L	**319**	**134**	**174**	**----**	**----**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**59**	**8**	**92**	**----**	**----**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**753**	**105**	**303**	**----**	**----**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**156**	**35**	**100**	**----**	**----**
Magnesium	7439-95-4	1	mg/L	**83**	**16**	**47**	**----**	**----**
Sodium	7440-23-5	1	mg/L	**297**	**57**	**100**	**----**	**----**
Potassium	7440-09-7	1	mg/L	**1**	<1	**2**	**----**	**----**
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	**0.008**	**----**	**----**
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	**----**	**----**
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.2**	**0.1**	**0.1**	**----**	**----**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	<0.01	**----**	**----**
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	**----**	**----**
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**4.08**	**0.23**	<0.01	**----**	**----**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SD03_1006	SD04_1206	SD05_1406	----	----
				Sampling date / time	10-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2318365-066	EB2318365-067	EB2318365-068	--------	--------
					Result	Result	Result	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**4.08**	**0.23**	<0.01	**----**	**----**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.09**	<0.01	**0.01**	**----**	**----**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**28.8**	**5.80**	**13.9**	**----**	**----**
ø Total Cations	----	0.01	meq/L		**27.6**	**5.54**	**13.2**	**----**	**----**
ø Ionic Balance	----	0.01	%		**2.28**	**2.32**	**2.50**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0015**	<0.0006	**0.0017**	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0012**	**0.0012**	<0.0012	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0051**	**0.0129**	**0.0147**	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0006	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	**0.0476**	**0.0117**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0079	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0016	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SD03_1006	SD04_1206	SD05_1406	----	----
				Sampling date / time	10-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2318365-066	EB2318365-067	EB2318365-068	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0051**	**0.0605**	**0.0264**	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0066**	**0.0605**	**0.0281**	----	----
^ Sum of PFAS	----	0.0002	µg/L		**0.0078**	**0.0617**	**0.0281**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**99.9**	**117**	**107**	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SD03_1006	SD04_1206	SD05_1406	----	----
				Sampling date / time	10-Jun-2023 00:00	12-Jun-2023 00:00	14-Jun-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2318365-066	EB2318365-067	EB2318365-068	--------	--------
					Result	Result	Result	----	----
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**103**	**101**	**92.0**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2318365**	Page	: 1 of 23
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 20-Jun-2023
Order number	: ----	Date Analysis Commenced	: 20-Jun-2023
C-O-C number	: ----	Issue Date	: 29-Jun-2023
Sampler	: DANIEL PAPINCZAK		
Site	: CALLIDE QUATERLY MONITORING		
Quote number	: BN/344/21 V3		
No. of samples received	: 68		
No. of samples analysed	: 68		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Keegan Mullane	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 5123417)									
EB2318365-022	MW69	EA005-P: pH Value	----	0.01	pH Unit	7.17	7.16	0.1	0% - 20%
EB2318365-015	MW40	EA005-P: pH Value	----	0.01	pH Unit	7.35	7.37	0.3	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5123424)									
EB2318505-013	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.13	7.11	0.3	0% - 20%
EB2318365-049	SW40	EA005-P: pH Value	----	0.01	pH Unit	7.78	7.80	0.3	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5123539)									
EB2318365-002	ESC3	EA005-P: pH Value	----	0.01	pH Unit	7.47	7.46	0.1	0% - 20%
EB2318365-029	MW78	EA005-P: pH Value	----	0.01	pH Unit	7.61	7.64	0.4	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5124561)									
EB2318365-034	RN13030127	EA005-P: pH Value	----	0.01	pH Unit	7.07	7.09	0.3	0% - 20%
EB2318491-004	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.93	7.93	0.0	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5125919)									
EB2318365-063	BD05_1406	EA005-P: pH Value	----	0.01	pH Unit	7.69	7.67	0.3	0% - 20%
EB2318560-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.93	7.93	0.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5123420)									
EB2318365-022	MW69	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1090	1080	0.9	0% - 20%
EB2318365-015	MW40	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	8990	9030	0.5	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5123423)									
EB2318505-013	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	378	369	2.4	0% - 20%
EB2318365-049	SW40	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1030	1030	0.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5123540)									
EB2318365-002	ESC3	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	9340	9200	1.5	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA010P: Conductivity by PC Titrator (QC Lot: 5123540) - continued									
EB2318365-029	MW78	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	11100	11000	0.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5124560)									
EB2318365-034	RN13030127	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	809	800	1.1	0% - 20%
EB2318491-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	992	1040	4.6	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5125917)									
EB2318365-063	BD05_1406	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1290	1300	0.2	0% - 20%
EB2318560-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	40200	41200	2.3	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5124223)									
EB2318365-001	Bore X	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	15800	16400	4.0	0% - 20%
EB2318365-010	MW11	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	7400	7520	1.7	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5124225)									
EB2318365-021	MW68	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	6240	6190	0.7	0% - 20%
EB2318365-030	MW79	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	6040	6120	1.2	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5124227)									
EB2318365-041	Notch-V2	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	13400	13400	0.3	0% - 20%
EB2318365-050	SW41	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	625	606	3.0	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5124222)									
EB2318365-001	Bore X	EA025LL: Suspended Solids (SS)	----	1	mg/L	24	24	0.0	0% - 20%
EB2318365-010	MW11	EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5124224)									
EB2318365-021	MW68	EA025LL: Suspended Solids (SS)	----	1	mg/L	13	14	0.0	0% - 50%
EB2318365-030	MW79	EA025LL: Suspended Solids (SS)	----	1	mg/L	30	32	3.9	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5124226)									
EB2318365-041	Notch-V2	EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit
EB2318365-050	SW41	EA025LL: Suspended Solids (SS)	----	1	mg/L	11	8	35.0	0% - 50%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5124228)									
EB2318365-067	SD04_1206	EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5123418)									
EB2318365-022	MW69	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	194	189	2.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	194	189	2.6	0% - 20%
EB2318365-015	MW40	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	673	674	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	673	674	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5123426)									
EB2318505-013	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5123426) - continued									
EB2318505-013	Anonymous	ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	58	61	5.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	58	61	5.0	0% - 20%
EB2318365-049	SW40	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	218	218	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	218	218	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5123542)									
EB2318365-002	ESC3	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	247	245	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	247	245	0.9	0% - 20%
EB2318365-029	MW78	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	617	616	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	617	616	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5124558)									
EB2318365-034	RN13030127	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	158	155	1.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	158	155	1.6	0% - 20%
EB2318491-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	525	524	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	525	524	0.3	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5125913)									
EB2318365-063	BD05_1406	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	177	176	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	177	176	0.0	0% - 20%
EB2318560-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	124	124	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	124	124	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5123543)									
EB2318505-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	4	0.0	No Limit
EB2318505-015	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	4	4	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5123544)									
EB2318365-018	MW49	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	897	895	0.2	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5123544) - continued									
EB2318365-040	Notch-V1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2340	2360	0.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5123545)									
EB2318365-001	Bore X	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2980	3020	1.3	0% - 20%
EB2318365-010	MW11	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1750	1760	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5123557)									
EB2318365-025	MW73	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	124	128	3.2	0% - 20%
EB2318365-067	SD04_1206	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	8	8	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5124498)									
EB2318456-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	283	284	0.0	0% - 20%
EB2318130-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	85	86	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5124852)									
EB2318365-020	MW60	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3120	3080	1.3	0% - 20%
EB2318130-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1	1	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5123546)									
EB2318505-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	29	30	0.0	0% - 20%
EB2318505-015	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	9	9	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5123547)									
EB2318365-018	MW49	ED045G: Chloride	16887-00-6	1	mg/L	4960	5000	0.8	0% - 20%
EB2318365-040	Notch-V1	ED045G: Chloride	16887-00-6	1	mg/L	5510	5560	0.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5123548)									
EB2318365-001	Bore X	ED045G: Chloride	16887-00-6	1	mg/L	6200	6230	0.4	0% - 20%
EB2318365-010	MW11	ED045G: Chloride	16887-00-6	1	mg/L	2360	2410	2.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5123558)									
EB2318365-025	MW73	ED045G: Chloride	16887-00-6	1	mg/L	644	639	0.8	0% - 20%
EB2318365-067	SD04_1206	ED045G: Chloride	16887-00-6	1	mg/L	105	106	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5124497)									
EB2318456-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	<1	<1	0.0	No Limit
EB2318130-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	723	734	1.6	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5124853)									
EB2318611-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2570	2610	1.2	0% - 20%
EB2318130-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3	3	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5130193)									
EB2318365-001	Bore X	ED093F: Calcium	7440-70-2	1	mg/L	676	692	2.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1020	1040	1.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2970	2990	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EB2318365-010	MW11	ED093F: Calcium	7440-70-2	1	mg/L	540	540	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	487	491	0.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5130193) - continued									
EB2318365-010	MW11	ED093F: Sodium	7440-23-5	1	mg/L	993	1010	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5130194)									
EB2318365-021	MW68	ED093F: Calcium	7440-70-2	1	mg/L	263	260	1.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	387	389	0.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1150	1160	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EB2318365-030	MW79	ED093F: Calcium	7440-70-2	1	mg/L	648	656	1.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	498	505	1.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	314	320	2.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	3	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5130195)									
EB2318365-031	MW80	ED093F: Calcium	7440-70-2	1	mg/L	93	92	1.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	70	70	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	238	236	0.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	14	14	0.0	0% - 50%
EB2318365-040	Notch-V1	ED093F: Calcium	7440-70-2	1	mg/L	574	566	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	848	832	1.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2610	2530	3.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5130196)									
EB2318365-059	BD01_0906	ED093F: Calcium	7440-70-2	1	mg/L	186	190	1.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	82	86	4.4	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	191	198	3.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EB2318365-068	SD05_1406	ED093F: Calcium	7440-70-2	1	mg/L	100	98	2.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	47	46	3.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	100	99	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5125191)									
ET2303111-012	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.748	0.751	0.4	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.26	0.26	0.0	No Limit
ET2302310-009	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.294	0.300	1.9	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.44	0.39	11.7	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5125604)									
EB2318365-014	MW32	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.780	0.778	0.3	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.25	0.24	0.0	No Limit
EB2318365-017	MW43	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.185	0.183	1.4	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.03	0.93	10.6	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 5125605)									
EB2318344-014	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	2.54	2.61	2.7	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	20.1	20.6	2.3	0% - 20%
EB2318344-005	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	7.31	7.26	0.8	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	19.8	22.5	12.7	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 5127623)									
EB2318491-005	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	1.47	1.41	4.1	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1290 µg/L	1.26	2.0	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 5127657)									
EB2318365-040	Notch-V1	EG020A-T: Manganese	7439-96-5	0.001	mg/L	1.87	1.87	0.2	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.09	0.09	0.0	No Limit
EB2318365-032	MW97	EG020A-T: Manganese	7439-96-5	0.001	mg/L	3.20	3.15	1.6	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	40.7	38.0	6.7	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 5127658)									
EB2318365-064	SD01_0906	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ET2303142-007	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5132916)									
EB2318365-001	Bore X	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.116	0.115	0.0	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.38	0.38	0.0	No Limit
EB2318365-046	SW20	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.076	0.078	1.6	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.25	0.24	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5123419)									
EB2318365-022	MW69	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EB2318365-015	MW40	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.6	0.6	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5123425)									
EB2318505-013	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
EB2318365-049	SW40	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5123541)									
EB2318365-002	ESC3	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.4	1.4	0.0	0% - 50%
EB2318365-029	MW78	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.1	1.1	0.0	0% - 50%
EK040P: Fluoride by PC Titrator (QC Lot: 5124559)									
EB2318365-034	RN13030127	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.0	No Limit
EB2318491-004	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	200 µg/L	0.2	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5125915)									
EB2318365-063	BD05_1406	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EB2318560-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.8	0.8	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5129669)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5129669) - continued									
EB2318365-001	Bore X	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.0	No Limit
EB2318365-011	MW26	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.25	0.25	0.0	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5129894)									
EB2318365-034	RN13030127	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.14	0.16	16.7	0% - 50%
EB2318365-044	SW02	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.10	0.10	0.0	0% - 50%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5129896)									
EB2318365-062	BD04_1206	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5134990)									
EB2318365-018	MW49	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.05	0.0	No Limit
EB2318365-028	MW76	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.27	0.27	0.0	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5123549)									
EB2318505-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.05	0.05	0.0	No Limit
EB2318505-015	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.04	0.04	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5123550)									
EB2318365-018	MW49	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2318365-040	Notch-V1	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5123551)									
EB2318365-001	Bore X	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.02	0.02	0.0	No Limit
EB2318365-010	MW11	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5123559)									
EB2318365-025	MW73	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2318365-067	SD04_1206	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5124494)									
EB2318456-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.03	0.03	0.0	No Limit
EB2318130-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5124849)									
EB2318611-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.01	0.01	0.0	No Limit
EB2318130-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5129670)									
EB2318365-001	Bore X	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.18	0.18	0.0	0% - 50%
EB2318365-011	MW26	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.80	0.80	0.0	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5129893)									
EB2318365-034	RN13030127	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.03	0.03	0.0	No Limit
EB2318365-044	SW02	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.05	0.04	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5129895)									
EB2318365-062	BD04_1206	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.23	0.23	0.0	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5134992)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5134992) - continued									
EB2318365-018	MW49	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2318365-028	MW76	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5123552)									
EB2318505-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.02	0.02	0.0	No Limit
EB2318505-015	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.03	0.03	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5123553)									
EB2318365-018	MW49	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2318365-040	Notch-V1	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5123554)									
EB2318365-001	Bore X	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.02	0.0	No Limit
EB2318365-010	MW11	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5123556)									
EB2318365-025	MW73	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2318365-067	SD04_1206	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5124495)									
EB2318130-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5124850)									
EB2318130-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5123417)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.7	98.0	102
EA005P: pH by PC Titrator (QCLot: 5123424)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA005P: pH by PC Titrator (QCLot: 5123539)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA005P: pH by PC Titrator (QCLot: 5124561)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA005P: pH by PC Titrator (QCLot: 5125919)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5123420)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	95.0	90.0	106
				<1	12890 µS/cm	96.6	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5123423)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	96.8	90.0	106
				<1	24800 µS/cm	99.6	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5123540)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	94.9	90.0	106
				<1	12890 µS/cm	96.3	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5124560)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	93.8	90.0	106
				<1	24800 µS/cm	99.4	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5125917)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	96.8	90.0	106
				<1	24800 µS/cm	99.1	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5124223)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5124223) - continued								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	107	88.0	112
				<10	2000 mg/L	95.2	80.9	118
				<10	2410 mg/L	111	81.3	119
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5124225)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	108	88.0	112
				<10	2000 mg/L	94.9	80.9	118
				<10	2410 mg/L	107	81.3	119
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5124227)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	106	88.0	112
				<10	2000 mg/L	98.9	80.9	118
				<10	2410 mg/L	106	81.3	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5124222)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	105	82.0	120
				<1	961 mg/L	104	84.7	116
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5124224)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	106	82.0	120
				<1	961 mg/L	107	84.7	116
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5124226)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	105	82.0	120
				<1	961 mg/L	105	84.7	116
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5124228)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	104	82.0	120
				<1	961 mg/L	106	84.7	116
ED037P: Alkalinity by PC Titrator (QCLot: 5123418)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	105	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5123426)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	102	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5123542)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.2	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5124558)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	103	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5125913)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	104	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5123543)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5123543) - continued								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	88.7	85.0	118
				<1	100 mg/L	92.7	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5123544)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	90.9	85.0	118
				<1	100 mg/L	93.1	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5123545)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	89.9	85.0	118
				<1	100 mg/L	95.0	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5123557)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.2	85.0	118
				<1	100 mg/L	98.8	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5124498)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.0	85.0	118
				<1	100 mg/L	94.7	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5124852)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.0	85.0	118
				<1	100 mg/L	103	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 5123546)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	90.0	115
				<1	1000 mg/L	104	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5123547)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	90.0	115
				<1	1000 mg/L	103	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5123548)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	90.0	115
				<1	1000 mg/L	104	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5123558)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.0	90.0	115
				<1	1000 mg/L	101	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5124497)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.7	90.0	115
				<1	1000 mg/L	104	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5124853)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.2	90.0	115
				<1	1000 mg/L	105	90.0	115

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 5130193)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.9	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.9	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5130194)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	108	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.0	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5130195)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	94.5	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	94.8	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.0	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5130196)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	107	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.4	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	97.3	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5125191)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	108	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5125604)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.9	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5125605)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	106	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.2	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5127623)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	105	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	112	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5127657)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	110	82.0	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 5127658)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	116	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5132916)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	101	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 5123419)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	10 mg/L	98.6	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5123425)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	102	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5123541)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	10 mg/L	96.0	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5124559)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	96.3	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5125915)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	98.4	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5129669)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	98.5	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5129894)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	94.2	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5129896)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	93.4	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5134990)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	98.1	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5123549)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	94.2	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5123550)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	93.4	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5123551)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	93.8	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5123559)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	91.8	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5124494)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	92.4	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5124849)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5124849) - continued								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	94.5	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5129670)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5129893)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	103	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5129895)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5134992)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	105	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5123552)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	102	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5123553)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	99.1	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5123554)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	103	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5123556)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	98.7	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5124495)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	97.5	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5124850)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	99.2	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5123301)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	92.4	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	97.9	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	95.4	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	104	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	94.0	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	99.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5123302)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	108	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	110	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	99.2	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	102	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	104	65.0	140

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5123302) - continued								
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	93.5	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5123303)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	116	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	127	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	127	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	131	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	110	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	110	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5123304)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	96.4	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	122	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	116	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	110	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	99.6	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	109	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5123301)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	88.8	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	92.4	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	90.8	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	92.4	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	85.6	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	94.8	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	96.4	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	92.0	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	93.6	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	105	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	98.7	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5123302)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	106	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	100	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	104	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	96.0	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	88.0	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	112	69.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5123302) - continued								
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	103	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	99.2	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	97.2	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	92.8	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	90.7	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5123303)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	118	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	104	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	118	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	124	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	99.2	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	114	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	129	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	98.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	86.0	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	98.4	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	104	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5123304)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	89.7	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	101	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	100	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	112	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	93.2	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	114	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	99.2	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	108	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	117	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	90.8	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5123301)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	95.6	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	107	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	105	57.9	141

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5123301) - continued								
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	112	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	99.7	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	102	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	92.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5123302)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	87.6	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	113	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	108	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	82.9	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	93.3	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	92.4	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	97.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5123303)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	118	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	# 144	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	120	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	109	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	112	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	123	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	127	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5123304)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	108	67.0	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5123304) - continued								
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	106	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	109	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	122	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	86.7	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	110	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5123301)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	85.6	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	97.7	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	100	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	# 138	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5123302)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	91.6	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	106	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	114	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	# 146	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5123303)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	106	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	107	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	110	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	121	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5123304)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	94.1	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	121	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	114	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	# 141	53.1	133
EP231P: PFAS Sums (QCLot: 5123301)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5123301) - continued								
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5123302)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5123303)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5123304)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5123543)							
EB2318505-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	92.8	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5123544)							
EB2318365-039	DRD	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5123545)							
EB2318365-008	MW06	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5123557)							
EB2318365-024	MW72	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	102	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5124498)							
EB2318130-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	93.4	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5124852)							
EB2318130-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	99.2	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5123546)							
EB2318505-005	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	104	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5123547)							
EB2318365-039	DRD	ED045G: Chloride	16887-00-6	400 mg/L	78.9	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5123548)							
EB2318365-008	MW06	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5123558)							
EB2318365-024	MW72	ED045G: Chloride	16887-00-6	400 mg/L	101	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5124497)							
EB2318130-005	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	112	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5124853)							
EB2318130-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	106	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5125191)							
ET2303111-011	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	87.2	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5125604)							
EB2318365-021	MW68	EG020A-T: Manganese	7439-96-5	1 mg/L	112	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5125605)							
EB2318344-018	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	# Not Determined	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5127623)							
EB2318365-067	SD04_1206	EG020A-T: Manganese	7439-96-5	1 mg/L	100	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5127657)							
EB2318365-047	SW22	EG020A-T: Manganese	7439-96-5	1 mg/L	104	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5127658)							
EB2318365-041	Notch-V2	EG020A-T: Manganese	7439-96-5	1 mg/L	109	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5132916)							
EB2318365-002	ESC3	EG020A-T: Manganese	7439-96-5	1 mg/L	# Not Determined	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5123419)							
EB2318365-023	MW70	EK040P: Fluoride	16984-48-8	5 mg/L	89.5	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5123425)							
EB2318505-011	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	97.8	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK040P: Fluoride by PC Titrator (QCLot: 5123541)							
EB2318365-003	ESC4	EK040P: Fluoride	16984-48-8	5 mg/L	72.9	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5124559)							
EB2318365-036	RN13030697	EK040P: Fluoride	16984-48-8	5 mg/L	76.8	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5125915)							
EB2318365-067	SD04_1206	EK040P: Fluoride	16984-48-8	5 mg/L	94.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5129669)							
EB2318365-002	ESC3	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	105	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5129894)							
EB2318365-035	RN13030692	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	99.6	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5129896)							
EB2318365-063	BD05_1406	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	101	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5134990)							
EB2318365-019	MW59	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	101	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5123549)							
EB2318505-005	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	98.3	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5123550)							
EB2318365-039	DRD	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	100	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5123551)							
EB2318365-008	MW06	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	91.4	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5123559)							
EB2318365-024	MW72	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	99.0	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5124494)							
EB2318130-005	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	98.5	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5124849)							
EB2318130-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	97.8	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5129670)							
EB2318365-002	ESC3	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	94.4	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5129893)							
EB2318365-035	RN13030692	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	102	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5129895)							
EB2318365-063	BD05_1406	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	# Not Determined	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5134992)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5134992) - continued							
EB2318365-019	MW59	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.2	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5123552)							
EB2318505-005	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	111	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5123553)							
EB2318365-039	DRD	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	110	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5123554)							
EB2318365-008	MW06	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	102	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5123556)							
EB2318365-024	MW72	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	99.1	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5124495)							
EB2318130-005	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	105	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5124850)							
EB2318130-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	115	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2318365**	Page	: 1 of 45
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 20-Jun-2023
Site	: CALLIDE QUATERLY MONITORING	Issue Date	: 29-Jun-2023
Sampler	: DANIEL PAPINCZAK	No. of samples received	: 68
Order number	: ----	No. of samples analysed	: 68

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-5123303-002	----	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	144 %	68.0-141%	**Recovery greater than upper control limit**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	QC-5123301-002	----	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	138 %	53.1-133%	**Recovery greater than upper control limit**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	QC-5123302-002	----	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	146 %	53.1-133%	**Recovery greater than upper control limit**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	QC-5123304-002	----	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	141 %	53.1-133%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2318365--008	MW06	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2318365--039	DRD	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2318365--008	MW06	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020T: Total Metals by ICP-MS	EB2318344--018	Anonymous	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020T: Total Metals by ICP-MS	EB2318365--002	ESC3	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EB2318365--063	BD05_1406	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA005P: pH by PC Titrator						

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
MW80	----	----	----	21-Jun-2023	06-Jun-2023	**15**
Clear Plastic Bottle - Natural						
DRD, PW2	----	----	----	22-Jun-2023	06-Jun-2023	**16**
Clear Plastic Bottle - Natural						
L006-B05, MW68, MW72, MW73	----	----	----	21-Jun-2023	07-Jun-2023	**14**
Clear Plastic Bottle - Natural						
SW12, SW22, SW40	----	----	----	22-Jun-2023	07-Jun-2023	**15**
Clear Plastic Bottle - Natural						
ESC3, MW09, MW11, MW78	----	----	----	21-Jun-2023	08-Jun-2023	**13**
Clear Plastic Bottle - Natural						
Notch-V1, Notch-V2	----	----	----	22-Jun-2023	08-Jun-2023	**14**
Clear Plastic Bottle - Natural						
MW31, MW43, RN13030692, RN13030698, SD01_0906	----	----	----	21-Jun-2023	09-Jun-2023	**12**
Clear Plastic Bottle - Natural						
BD01_0906	----	----	----	22-Jun-2023	09-Jun-2023	**13**
Clear Plastic Bottle - Natural						
MW32, RN13030126, BD02_1006, BD03_1006, SD02_1006	----	----	----	21-Jun-2023	10-Jun-2023	**11**
Clear Plastic Bottle - Natural						
RN13030127, RN13030697, RN13030715, SW20, SW36, SD03_1006	----	----	----	22-Jun-2023	10-Jun-2023	**12**
Clear Plastic Bottle - Natural						
ESC4, L021-B01, MW40, MW42, MW49, MW74, BD04_1206	----	----	----	21-Jun-2023	12-Jun-2023	**9**
Clear Plastic Bottle - Natural						
PW1, SW02, SW41, SD04_1206	----	----	----	22-Jun-2023	12-Jun-2023	**10**
Clear Plastic Bottle - Natural						
L005-B01, MW69, MW70, MW75, MW79	----	----	----	21-Jun-2023	13-Jun-2023	**8**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
MW76	----	----	----	22-Jun-2023	13-Jun-2023	**9**
Clear Plastic Bottle - Natural						
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97, SD05_1406	----	----	----	21-Jun-2023	14-Jun-2023	**7**
Clear Plastic Bottle - Natural						
BD05_1406	----	----	----	22-Jun-2023	14-Jun-2023	**8**
EA015: Total Dissolved Solids dried at 180 ± 5 °C						
Clear Plastic Bottle - Natural						
MW80, DRD, PW2	----	----	----	22-Jun-2023	13-Jun-2023	**9**
Clear Plastic Bottle - Natural						
L006-B05, MW68, MW72, MW73, SW12, SW22, SW40	----	----	----	22-Jun-2023	14-Jun-2023	**8**
Clear Plastic Bottle - Natural						
ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	----	----	----	22-Jun-2023	15-Jun-2023	**7**
Clear Plastic Bottle - Natural						
MW31, MW43, RN13030692, RN13030698, BD01_0906, SD01_0906	----	----	----	22-Jun-2023	16-Jun-2023	**6**
Clear Plastic Bottle - Natural						
MW32, RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	----	----	----	22-Jun-2023	17-Jun-2023	**5**
Clear Plastic Bottle - Natural						
ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	----	----	----	22-Jun-2023	19-Jun-2023	**3**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA015: Total Dissolved Solids dried at 180 ± 5 °C - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural L005-B01, MW69, MW70, MW75, MW76, MW79	----	----	----	22-Jun-2023	20-Jun-2023	**2**
Clear Plastic Bottle - Natural Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97, BD05_1406, SD05_1406	----	----	----	22-Jun-2023	21-Jun-2023	**1**
EA025: Total Suspended Solids dried at 104 ± 2°C						
Clear Plastic Bottle - Natural MW80, DRD, PW2	----	----	----	22-Jun-2023	13-Jun-2023	**9**
Clear Plastic Bottle - Natural L006-B05, MW68, MW72, MW73, SW12, SW22, SW40	----	----	----	22-Jun-2023	14-Jun-2023	**8**
Clear Plastic Bottle - Natural ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	----	----	----	22-Jun-2023	15-Jun-2023	**7**
Clear Plastic Bottle - Natural MW31, MW43, RN13030692, RN13030698, BD01_0906, SD01_0906	----	----	----	22-Jun-2023	16-Jun-2023	**6**
Clear Plastic Bottle - Natural MW32, RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	----	----	----	22-Jun-2023	17-Jun-2023	**5**
Clear Plastic Bottle - Natural ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	----	----	----	22-Jun-2023	19-Jun-2023	**3**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA025: Total Suspended Solids dried at 104 ± 2°C - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
L005-B01, MW69, MW70, MW75, MW76, MW79	----	----	----	22-Jun-2023	20-Jun-2023	**2**
Clear Plastic Bottle - Natural						
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97, BD05_1406, SD05_1406	----	----	----	22-Jun-2023	21-Jun-2023	**1**
ED037P: Alkalinity by PC Titrator						
Clear Plastic Bottle - Natural						
MW80	----	----	----	21-Jun-2023	20-Jun-2023	**1**
Clear Plastic Bottle - Natural						
DRD, PW2	----	----	----	22-Jun-2023	20-Jun-2023	**2**
Clear Plastic Bottle - Natural						
SW12, SW22, SW40	----	----	----	22-Jun-2023	21-Jun-2023	**1**
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
MW80, DRD, PW2	----	----	----	27-Jun-2023	13-Jun-2023	**14**
Clear Plastic Bottle - Natural						
L006-B05, MW68, MW72, MW73	----	----	----	24-Jun-2023	14-Jun-2023	**10**
Clear Plastic Bottle - Natural						
SW12, SW22, SW40	----	----	----	27-Jun-2023	14-Jun-2023	**13**
Clear Plastic Bottle - Natural						
ESC3, MW09, MW11, MW78	----	----	----	24-Jun-2023	15-Jun-2023	**9**
Clear Plastic Bottle - Natural						
Notch-V1, Notch-V2	----	----	----	27-Jun-2023	15-Jun-2023	**12**
Clear Plastic Bottle - Natural						
MW31, MW43	----	----	----	24-Jun-2023	16-Jun-2023	**8**
Clear Plastic Bottle - Natural						
RN13030692, RN13030698, BD01_0906, SD01_0906	----	----	----	27-Jun-2023	16-Jun-2023	**11**
Clear Plastic Bottle - Natural						
MW32	----	----	----	24-Jun-2023	17-Jun-2023	**7**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	----	----	----	27-Jun-2023	17-Jun-2023	**10**
Clear Plastic Bottle - Natural						
ESC4, L021-B01, MW40, MW42, MW49, MW74	----	----	----	24-Jun-2023	19-Jun-2023	**5**
Clear Plastic Bottle - Natural						
PW1, SW02, SW41, BD04_1206, SD04_1206	----	----	----	27-Jun-2023	19-Jun-2023	**8**
Clear Plastic Bottle - Natural						
L005-B01, MW69, MW70, MW75, MW76, MW79	----	----	----	24-Jun-2023	20-Jun-2023	**4**
Clear Plastic Bottle - Natural						
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60	----	----	----	24-Jun-2023	21-Jun-2023	**3**
Clear Plastic Bottle - Natural						
MW97, BD05_1406, SD05_1406	----	----	----	27-Jun-2023	21-Jun-2023	**6**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
MW80, DRD, PW2	----	----	----	20-Jun-2023	08-Jun-2023	**12**
Clear Plastic Bottle - Natural						
L006-B05, MW68, MW72, MW73, SW12, SW22, SW40	----	----	----	20-Jun-2023	09-Jun-2023	**11**
Clear Plastic Bottle - Natural						
ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	----	----	----	20-Jun-2023	10-Jun-2023	**10**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK057G: Nitrite as N by Discrete Analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural MW31, MW43, RN13030692, RN13030698, BD01_0906, SD01_0906	----	----	----	20-Jun-2023	11-Jun-2023	**9**
Clear Plastic Bottle - Natural MW32, RN13030126, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	----	----	----	20-Jun-2023	12-Jun-2023	**8**
Clear Plastic Bottle - Natural RN13030127, RN13030697	----	----	----	21-Jun-2023	12-Jun-2023	**9**
Clear Plastic Bottle - Natural ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	----	----	----	20-Jun-2023	14-Jun-2023	**6**
Clear Plastic Bottle - Natural L005-B01, MW69, MW70, MW75, MW76, MW79	----	----	----	20-Jun-2023	15-Jun-2023	**5**
Clear Plastic Bottle - Natural Bore X, L012-B01, MW06, MW26, MW27, MW59, MW97, BD05_1406, SD05_1406	----	----	----	20-Jun-2023	16-Jun-2023	**4**
Clear Plastic Bottle - Natural MW60	----	----	----	22-Jun-2023	16-Jun-2023	**6**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural MW80, DRD, PW2	----	----	----	20-Jun-2023	08-Jun-2023	**12**
Clear Plastic Bottle - Natural L006-B05, MW68, MW72, MW73, SW12, SW22, SW40	----	----	----	20-Jun-2023	09-Jun-2023	**11**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK071G: Reactive Phosphorus as P by discrete analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	----	----	----	20-Jun-2023	10-Jun-2023	**10**
Clear Plastic Bottle - Natural MW31, MW43, RN13030692, RN13030698, BD01_0906, SD01_0906	----	----	----	20-Jun-2023	11-Jun-2023	**9**
Clear Plastic Bottle - Natural MW32, RN13030126, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	----	----	----	20-Jun-2023	12-Jun-2023	**8**
Clear Plastic Bottle - Natural RN13030127, RN13030697	----	----	----	21-Jun-2023	12-Jun-2023	**9**
Clear Plastic Bottle - Natural ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	----	----	----	20-Jun-2023	14-Jun-2023	**6**
Clear Plastic Bottle - Natural L005-B01, MW69, MW70, MW75, MW76, MW79	----	----	----	20-Jun-2023	15-Jun-2023	**5**
Clear Plastic Bottle - Natural Bore X, L012-B01, MW06, MW26, MW27, MW59, MW97, BD05_1406, SD05_1406	----	----	----	20-Jun-2023	16-Jun-2023	**4**
Clear Plastic Bottle - Natural MW60	----	----	----	22-Jun-2023	16-Jun-2023	**6**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)	0				

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP) - Continued					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	77	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	77	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) MW80	**06-Jun-2023**	**----**	----	----	**21-Jun-2023**	06-Jun-2023	×
Clear Plastic Bottle - Natural (EA005-P) DRD, PW2	**06-Jun-2023**	**----**	----	----	**22-Jun-2023**	06-Jun-2023	×
Clear Plastic Bottle - Natural (EA005-P) L006-B05, MW68, MW72, MW73	**07-Jun-2023**	**----**	----	----	**21-Jun-2023**	07-Jun-2023	×
Clear Plastic Bottle - Natural (EA005-P) SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**22-Jun-2023**	07-Jun-2023	×
Clear Plastic Bottle - Natural (EA005-P) ESC3, MW09, MW11, MW78	**08-Jun-2023**	**----**	----	----	**21-Jun-2023**	08-Jun-2023	×
Clear Plastic Bottle - Natural (EA005-P) Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**22-Jun-2023**	08-Jun-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW31, MW43, RN13030692, RN13030698, SD01_0906	**09-Jun-2023**	**----**	----	----	**21-Jun-2023**	09-Jun-2023	×
Clear Plastic Bottle - Natural (EA005-P) BD01_0906	**09-Jun-2023**	**----**	----	----	**22-Jun-2023**	09-Jun-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW32, RN13030126, BD02_1006, BD03_1006, SD02_1006	**10-Jun-2023**	**----**	----	----	**21-Jun-2023**	10-Jun-2023	×
Clear Plastic Bottle - Natural (EA005-P)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator - Continued							
RN13030127, RN13030697, RN13030715, SW20, SW36, SD03_1006	**10-Jun-2023**	**----**	----	----	**22-Jun-2023**	10-Jun-2023	✘
Clear Plastic Bottle - Natural (EA005-P) ESC4, L021-B01, MW40, MW42, MW49, MW74, BD04_1206	**12-Jun-2023**	**----**	----	----	**21-Jun-2023**	12-Jun-2023	✘
Clear Plastic Bottle - Natural (EA005-P) PW1, SW02, SW41, SD04_1206	**12-Jun-2023**	**----**	----	----	**22-Jun-2023**	12-Jun-2023	✘
Clear Plastic Bottle - Natural (EA005-P) L005-B01, MW69, MW70, MW75, MW79	**13-Jun-2023**	**----**	----	----	**21-Jun-2023**	13-Jun-2023	✘
Clear Plastic Bottle - Natural (EA005-P) MW76	**13-Jun-2023**	**----**	----	----	**22-Jun-2023**	13-Jun-2023	✘
Clear Plastic Bottle - Natural (EA005-P) Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97, SD05_1406	**14-Jun-2023**	**----**	----	----	**21-Jun-2023**	14-Jun-2023	✘
Clear Plastic Bottle - Natural (EA005-P) BD05_1406	**14-Jun-2023**	**----**	----	----	**22-Jun-2023**	14-Jun-2023	✘

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) MW80	**06-Jun-2023**	**----**	----	----	**21-Jun-2023**	04-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) DRD, PW2	**06-Jun-2023**	**----**	----	----	**22-Jun-2023**	04-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) L006-B05, MW68, MW72, MW73	**07-Jun-2023**	**----**	----	----	**21-Jun-2023**	05-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**22-Jun-2023**	05-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) ESC3, MW09, MW11, MW78	**08-Jun-2023**	**----**	----	----	**21-Jun-2023**	06-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**22-Jun-2023**	06-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW31, MW43, RN13030692, RN13030698, SD01_0906	**09-Jun-2023**	**----**	----	----	**21-Jun-2023**	07-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) BD01_0906	**09-Jun-2023**	**----**	----	----	**22-Jun-2023**	07-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW32, RN13030126, BD02_1006, BD03_1006, SD02_1006	**10-Jun-2023**	**----**	----	----	**21-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) RN13030127, RN13030697, RN13030715, SW20, SW36, SD03_1006	**10-Jun-2023**	**----**	----	----	**22-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) ESC4, L021-B01, MW40, MW42, MW49, MW74, BD04_1206	**12-Jun-2023**	**----**	----	----	**21-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) PW1, SW02, SW41, SD04_1206	**12-Jun-2023**	**----**	----	----	**22-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) L005-B01, MW69, MW70, MW75, MW79	**13-Jun-2023**	**----**	----	----	**21-Jun-2023**	11-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW76	**13-Jun-2023**	**----**	----	----	**22-Jun-2023**	11-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010P: Conductivity by PC Titrator - Continued							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97, SD05_1406	**14-Jun-2023**	**----**	----	**----**	**21-Jun-2023**	12-Jul-2023	✓
Clear Plastic Bottle - Natural (EA010-P)							
BD05_1406	**14-Jun-2023**	**----**	----	**----**	**22-Jun-2023**	12-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
MW80, DRD, PW2	**06-Jun-2023**	**----**	----	----	**22-Jun-2023**	13-Jun-2023	×
Clear Plastic Bottle - Natural (EA015H)							
L006-B05, MW68, MW72, MW73, SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**22-Jun-2023**	14-Jun-2023	×
Clear Plastic Bottle - Natural (EA015H)							
ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**22-Jun-2023**	15-Jun-2023	×
Clear Plastic Bottle - Natural (EA015H)							
MW31, MW43, RN13030692, RN13030698, BD01_0906, SD01_0906	**09-Jun-2023**	**----**	----	----	**22-Jun-2023**	16-Jun-2023	×
Clear Plastic Bottle - Natural (EA015H)							
MW32, RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**----**	----	----	**22-Jun-2023**	17-Jun-2023	×
Clear Plastic Bottle - Natural (EA015H)							
ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	**12-Jun-2023**	**----**	----	----	**22-Jun-2023**	19-Jun-2023	×
Clear Plastic Bottle - Natural (EA015H)							
L005-B01, MW69, MW70, MW75, MW76, MW79	**13-Jun-2023**	**----**	----	----	**22-Jun-2023**	20-Jun-2023	×
Clear Plastic Bottle - Natural (EA015H)							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97, BD05_1406, SD05_1406	**14-Jun-2023**	**----**	----	----	**22-Jun-2023**	21-Jun-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025LL)							
MW80, DRD, PW2	**06-Jun-2023**	**----**	----	----	**22-Jun-2023**	13-Jun-2023	×
Clear Plastic Bottle - Natural (EA025LL)							
L006-B05, MW68, MW72, MW73, SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**22-Jun-2023**	14-Jun-2023	×
Clear Plastic Bottle - Natural (EA025LL)							
ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**22-Jun-2023**	15-Jun-2023	×
Clear Plastic Bottle - Natural (EA025LL)							
MW31, MW43, RN13030692, RN13030698, BD01_0906, SD01_0906	**09-Jun-2023**	**----**	----	----	**22-Jun-2023**	16-Jun-2023	×
Clear Plastic Bottle - Natural (EA025LL)							
MW32, RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**----**	----	----	**22-Jun-2023**	17-Jun-2023	×
Clear Plastic Bottle - Natural (EA025LL)							
ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	**12-Jun-2023**	**----**	----	----	**22-Jun-2023**	19-Jun-2023	×
Clear Plastic Bottle - Natural (EA025LL)							
L005-B01, MW69, MW70, MW75, MW76, MW79	**13-Jun-2023**	**----**	----	----	**22-Jun-2023**	20-Jun-2023	×
Clear Plastic Bottle - Natural (EA025LL)							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97, BD05_1406, SD05_1406	**14-Jun-2023**	**----**	----	----	**22-Jun-2023**	21-Jun-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
MW80	**06-Jun-2023**	**----**	----	----	**21-Jun-2023**	20-Jun-2023	×
Clear Plastic Bottle - Natural (ED037-P)							
DRD, PW2	**06-Jun-2023**	**----**	----	----	**22-Jun-2023**	20-Jun-2023	×
Clear Plastic Bottle - Natural (ED037-P)							
L006-B05, MW68, MW72, MW73	**07-Jun-2023**	**----**	----	----	**21-Jun-2023**	21-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**22-Jun-2023**	21-Jun-2023	×
Clear Plastic Bottle - Natural (ED037-P)							
ESC3, MW09, MW11, MW78	**08-Jun-2023**	**----**	----	----	**21-Jun-2023**	22-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**22-Jun-2023**	22-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
MW31, MW43, RN13030692, RN13030698, SD01_0906	**09-Jun-2023**	**----**	----	----	**21-Jun-2023**	23-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
BD01_0906	**09-Jun-2023**	**----**	----	----	**22-Jun-2023**	23-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
MW32, RN13030126, BD02_1006, BD03_1006, SD02_1006	**10-Jun-2023**	**----**	----	----	**21-Jun-2023**	24-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
RN13030127, RN13030697, RN13030715, SW20, SW36, SD03_1006	**10-Jun-2023**	**----**	----	----	**22-Jun-2023**	24-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
ESC4, L021-B01, MW40, MW42, MW49, MW74, BD04_1206	**12-Jun-2023**	**----**	----	----	**21-Jun-2023**	26-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
PW1, SW02, SW41, SD04_1206	**12-Jun-2023**	**----**	----	----	**22-Jun-2023**	26-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
L005-B01, MW69, MW70, MW75, MW79	**13-Jun-2023**	**----**	----	----	**21-Jun-2023**	27-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
MW76	**13-Jun-2023**	**----**	----	----	**22-Jun-2023**	27-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator - Continued							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97, SD05_1406	**14-Jun-2023**	**----**	----	**----**	**21-Jun-2023**	28-Jun-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
BD05_1406	**14-Jun-2023**	**----**	----	**----**	**22-Jun-2023**	28-Jun-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) MW80, DRD, PW2	**06-Jun-2023**	----	----	----	**20-Jun-2023**	04-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G) L006-B05, MW68, MW72, MW73, SW12, SW22, SW40	**07-Jun-2023**	----	----	----	**20-Jun-2023**	05-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G) ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	----	----	----	**20-Jun-2023**	06-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G) MW31, MW43, RN13030692, RN13030698, BD01_0906, SD01_0906	**09-Jun-2023**	----	----	----	**20-Jun-2023**	07-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G) MW32, RN13030126, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	----	----	----	**20-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G) RN13030127, RN13030697	**10-Jun-2023**	----	----	----	**21-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G) ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	**12-Jun-2023**	----	----	----	**20-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G) L005-B01, MW69, MW70, MW75, MW76, MW79	**13-Jun-2023**	----	----	----	**20-Jun-2023**	11-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G) Bore X, L012-B01, MW06, MW26, MW27, MW59, MW97, BD05_1406, SD05_1406	**14-Jun-2023**	----	----	----	**20-Jun-2023**	12-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G) MW60	**14-Jun-2023**	----	----	----	**22-Jun-2023**	12-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
MW80, DRD, PW2	**06-Jun-2023**	**----**	----	----	**20-Jun-2023**	04-Jul-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
L006-B05, MW68, MW72, MW73, SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**20-Jun-2023**	05-Jul-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**20-Jun-2023**	06-Jul-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
MW31, MW43, RN13030692, RN13030698, BD01_0906, SD01_0906	**09-Jun-2023**	**----**	----	----	**20-Jun-2023**	07-Jul-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
MW32, RN13030126, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**----**	----	----	**20-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
RN13030127, RN13030697	**10-Jun-2023**	**----**	----	----	**21-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	**12-Jun-2023**	**----**	----	----	**20-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
L005-B01, MW69, MW70, MW75, MW76, MW79	**13-Jun-2023**	**----**	----	----	**20-Jun-2023**	11-Jul-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW97, BD05_1406, SD05_1406	**14-Jun-2023**	**----**	----	----	**20-Jun-2023**	12-Jul-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
MW60	**14-Jun-2023**	**----**	----	----	**22-Jun-2023**	12-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F) MW80, DRD, PW2	**06-Jun-2023**	**----**	----	----	**27-Jun-2023**	13-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) L006-B05, MW68, MW72, MW73	**07-Jun-2023**	**----**	----	----	**24-Jun-2023**	14-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**27-Jun-2023**	14-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) ESC3, MW09, MW11, MW78	**08-Jun-2023**	**----**	----	----	**24-Jun-2023**	15-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**27-Jun-2023**	15-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) MW31, MW43	**09-Jun-2023**	**----**	----	----	**24-Jun-2023**	16-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) RN13030692, RN13030698, BD01_0906, SD01_0906	**09-Jun-2023**	**----**	----	----	**27-Jun-2023**	16-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) MW32	**10-Jun-2023**	**----**	----	----	**24-Jun-2023**	17-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**----**	----	----	**27-Jun-2023**	17-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) ESC4, L021-B01, MW40, MW42, MW49, MW74	**12-Jun-2023**	**----**	----	----	**24-Jun-2023**	19-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) PW1, SW02, SW41, BD04_1206, SD04_1206	**12-Jun-2023**	**----**	----	----	**27-Jun-2023**	19-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F) L005-B01, MW69, MW70, MW75, MW76, MW79	**13-Jun-2023**	**----**	----	----	**24-Jun-2023**	20-Jun-2023	×
Clear Plastic Bottle - Natural (ED093F)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations - Continued							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60	**14-Jun-2023**	**----**	----	**----**	**24-Jun-2023**	21-Jun-2023	✘
Clear Plastic Bottle - Natural (ED093F)							
MW97, BD05_1406, SD05_1406	**14-Jun-2023**	**----**	----	**----**	**27-Jun-2023**	21-Jun-2023	✘

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW80	**06-Jun-2023**	**22-Jun-2023**	03-Dec-2023	✓	**23-Jun-2023**	03-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) DRD, PW2	**06-Jun-2023**	**22-Jun-2023**	03-Dec-2023	✓	**24-Jun-2023**	03-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW68, MW72, MW73	**07-Jun-2023**	**21-Jun-2023**	04-Dec-2023	✓	**24-Jun-2023**	04-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) SW12	**07-Jun-2023**	**22-Jun-2023**	04-Dec-2023	✓	**23-Jun-2023**	04-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) SW22, SW40	**07-Jun-2023**	**22-Jun-2023**	04-Dec-2023	✓	**24-Jun-2023**	04-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) L006-B05	**07-Jun-2023**	**26-Jun-2023**	04-Dec-2023	✓	**27-Jun-2023**	04-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW11, MW78	**08-Jun-2023**	**21-Jun-2023**	05-Dec-2023	✓	**24-Jun-2023**	05-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) Notch-V1, Notch-V2	**08-Jun-2023**	**22-Jun-2023**	05-Dec-2023	✓	**24-Jun-2023**	05-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) ESC3, MW09	**08-Jun-2023**	**26-Jun-2023**	05-Dec-2023	✓	**27-Jun-2023**	05-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW31, MW43	**09-Jun-2023**	**21-Jun-2023**	06-Dec-2023	✓	**24-Jun-2023**	06-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) RN13030692, BD01_0906	**09-Jun-2023**	**22-Jun-2023**	06-Dec-2023	✓	**23-Jun-2023**	06-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) RN13030698, SD01_0906	**09-Jun-2023**	**22-Jun-2023**	06-Dec-2023	✓	**24-Jun-2023**	06-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW32	**10-Jun-2023**	**21-Jun-2023**	07-Dec-2023	✓	**24-Jun-2023**	07-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) RN13030715	**10-Jun-2023**	**22-Jun-2023**	07-Dec-2023	✓	**23-Jun-2023**	07-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) RN13030126, RN13030127, RN13030697, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**22-Jun-2023**	07-Dec-2023	✓	**24-Jun-2023**	07-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) SW20	**10-Jun-2023**	**26-Jun-2023**	07-Dec-2023	✓	**27-Jun-2023**	07-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW40, MW42	**12-Jun-2023**	**21-Jun-2023**	09-Dec-2023	✓	**22-Jun-2023**	09-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW49, MW74	**12-Jun-2023**	**21-Jun-2023**	09-Dec-2023	✓	**24-Jun-2023**	09-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) SD04_1206	**12-Jun-2023**	**22-Jun-2023**	09-Dec-2023	✓	**23-Jun-2023**	09-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS - Continued							
PW1, SW02, SW41, BD04_1206	**12-Jun-2023**	**22-Jun-2023**	09-Dec-2023	✓	**24-Jun-2023**	09-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) ESC4, L021-B01	**12-Jun-2023**	**26-Jun-2023**	09-Dec-2023	✓	**27-Jun-2023**	09-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW69, MW70, MW75, MW76	**13-Jun-2023**	**21-Jun-2023**	10-Dec-2023	✓	**24-Jun-2023**	10-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW79	**13-Jun-2023**	**22-Jun-2023**	10-Dec-2023	✓	**24-Jun-2023**	10-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) L005-B01	**13-Jun-2023**	**26-Jun-2023**	10-Dec-2023	✓	**27-Jun-2023**	10-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW27	**14-Jun-2023**	**21-Jun-2023**	11-Dec-2023	✓	**22-Jun-2023**	11-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW26, MW59, MW60	**14-Jun-2023**	**21-Jun-2023**	11-Dec-2023	✓	**24-Jun-2023**	11-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) SD05_1406	**14-Jun-2023**	**22-Jun-2023**	11-Dec-2023	✓	**23-Jun-2023**	11-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW97, BD05_1406	**14-Jun-2023**	**22-Jun-2023**	11-Dec-2023	✓	**24-Jun-2023**	11-Dec-2023	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) Bore X, L012-B01, MW06	**14-Jun-2023**	**26-Jun-2023**	11-Dec-2023	✓	**27-Jun-2023**	11-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P) MW80	**06-Jun-2023**	**----**	----	----	**21-Jun-2023**	04-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) DRD, PW2	**06-Jun-2023**	**----**	----	----	**22-Jun-2023**	04-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) L006-B05, MW68, MW72, MW73	**07-Jun-2023**	**----**	----	----	**21-Jun-2023**	05-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**22-Jun-2023**	05-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) ESC3, MW09, MW11, MW78	**08-Jun-2023**	**----**	----	----	**21-Jun-2023**	06-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**22-Jun-2023**	06-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW31, MW43, RN13030692, RN13030698, SD01_0906	**09-Jun-2023**	**----**	----	----	**21-Jun-2023**	07-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) BD01_0906	**09-Jun-2023**	**----**	----	----	**22-Jun-2023**	07-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW32, RN13030126, BD02_1006, BD03_1006, SD02_1006	**10-Jun-2023**	**----**	----	----	**21-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) RN13030127, RN13030697, RN13030715, SW20, SW36, SD03_1006	**10-Jun-2023**	**----**	----	----	**22-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) ESC4, L021-B01, MW40, MW42, MW49, MW74, BD04_1206	**12-Jun-2023**	**----**	----	----	**21-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) PW1, SW02, SW41, SD04_1206	**12-Jun-2023**	**----**	----	----	**22-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) L005-B01, MW69, MW70, MW75, MW79	**13-Jun-2023**	**----**	----	----	**21-Jun-2023**	11-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW76	**13-Jun-2023**	**----**	----	----	**22-Jun-2023**	11-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK040P: Fluoride by PC Titrator - Continued							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97, SD05_1406	**14-Jun-2023**	**----**	----	**----**	**21-Jun-2023**	12-Jul-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
BD05_1406	**14-Jun-2023**	**----**	----	**----**	**22-Jun-2023**	12-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW80, DRD, PW2	**06-Jun-2023**	**----**	----	----	**26-Jun-2023**	04-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) L006-B05	**07-Jun-2023**	**----**	----	----	**23-Jun-2023**	05-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW68, MW72, MW73, SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**26-Jun-2023**	05-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) ESC3, MW09, MW11	**08-Jun-2023**	**----**	----	----	**23-Jun-2023**	06-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**26-Jun-2023**	06-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW31, MW43	**09-Jun-2023**	**----**	----	----	**23-Jun-2023**	07-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) RN13030692, RN13030698, BD01_0906, SD01_0906	**09-Jun-2023**	**----**	----	----	**26-Jun-2023**	07-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW32	**10-Jun-2023**	**----**	----	----	**23-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**----**	----	----	**26-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) ESC4, L021-B01, MW40, MW42	**12-Jun-2023**	**----**	----	----	**23-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	**12-Jun-2023**	**----**	----	----	**26-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) L005-B01	**13-Jun-2023**	**----**	----	----	**23-Jun-2023**	11-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW69, MW70, MW75, MW76, MW79	**13-Jun-2023**	**----**	----	----	**26-Jun-2023**	11-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser - Continued							
Bore X, L012-B01, MW06, MW26, MW27	**14-Jun-2023**	**----**	----	**----**	**23-Jun-2023**	12-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW59, MW60, MW97, BD05_1406, SD05_1406	**14-Jun-2023**	**----**	----	**----**	**26-Jun-2023**	12-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
MW80, DRD, PW2	**06-Jun-2023**	----	----	----	**20-Jun-2023**	08-Jun-2023	✘
Clear Plastic Bottle - Natural (EK057G)							
L006-B05, MW68, MW72, MW73, SW12, SW22, SW40	**07-Jun-2023**	----	----	----	**20-Jun-2023**	09-Jun-2023	✘
Clear Plastic Bottle - Natural (EK057G)							
ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	----	----	----	**20-Jun-2023**	10-Jun-2023	✘
Clear Plastic Bottle - Natural (EK057G)							
MW31, MW43, RN13030692, RN13030698, BD01_0906, SD01_0906	**09-Jun-2023**	----	----	----	**20-Jun-2023**	11-Jun-2023	✘
Clear Plastic Bottle - Natural (EK057G)							
MW32, RN13030126, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	----	----	----	**20-Jun-2023**	12-Jun-2023	✘
Clear Plastic Bottle - Natural (EK057G)							
RN13030127, RN13030697	**10-Jun-2023**	----	----	----	**21-Jun-2023**	12-Jun-2023	✘
Clear Plastic Bottle - Natural (EK057G)							
ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	**12-Jun-2023**	----	----	----	**20-Jun-2023**	14-Jun-2023	✘
Clear Plastic Bottle - Natural (EK057G)							
L005-B01, MW69, MW70, MW75, MW76, MW79	**13-Jun-2023**	----	----	----	**20-Jun-2023**	15-Jun-2023	✘
Clear Plastic Bottle - Natural (EK057G)							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW97, BD05_1406, SD05_1406	**14-Jun-2023**	----	----	----	**20-Jun-2023**	16-Jun-2023	✘
Clear Plastic Bottle - Natural (EK057G)							
MW60	**14-Jun-2023**	----	----	----	**22-Jun-2023**	16-Jun-2023	✘

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW80, DRD, PW2	**06-Jun-2023**	**----**	----	----	**26-Jun-2023**	04-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) L006-B05	**07-Jun-2023**	**----**	----	----	**23-Jun-2023**	05-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW68, MW72, MW73, SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**26-Jun-2023**	05-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) ESC3, MW09, MW11	**08-Jun-2023**	**----**	----	----	**23-Jun-2023**	06-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**26-Jun-2023**	06-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW31, MW43	**09-Jun-2023**	**----**	----	----	**23-Jun-2023**	07-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) RN13030692, RN13030698, BD01_0906, SD01_0906	**09-Jun-2023**	**----**	----	----	**26-Jun-2023**	07-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW32	**10-Jun-2023**	**----**	----	----	**23-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**----**	----	----	**26-Jun-2023**	08-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) ESC4, L021-B01, MW40, MW42	**12-Jun-2023**	**----**	----	----	**23-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	**12-Jun-2023**	**----**	----	----	**26-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) L005-B01	**13-Jun-2023**	**----**	----	----	**23-Jun-2023**	11-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW69, MW70, MW75, MW76, MW79	**13-Jun-2023**	**----**	----	----	**26-Jun-2023**	11-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued							
Bore X, L012-B01, MW06, MW26, MW27	**14-Jun-2023**	**----**	----	**----**	**23-Jun-2023**	12-Jul-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
MW59, MW60, MW97, BD05_1406, SD05_1406	**14-Jun-2023**	**----**	----	**----**	**26-Jun-2023**	12-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) MW80, DRD, PW2	**06-Jun-2023**	**----**	----	----	**20-Jun-2023**	08-Jun-2023	✘
Clear Plastic Bottle - Natural (EK071G) L006-B05, MW68, MW72, MW73, SW12, SW22, SW40	**07-Jun-2023**	**----**	----	----	**20-Jun-2023**	09-Jun-2023	✘
Clear Plastic Bottle - Natural (EK071G) ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**----**	----	----	**20-Jun-2023**	10-Jun-2023	✘
Clear Plastic Bottle - Natural (EK071G) MW31, MW43, RN13030692, RN13030698, BD01_0906, SD01_0906	**09-Jun-2023**	**----**	----	----	**20-Jun-2023**	11-Jun-2023	✘
Clear Plastic Bottle - Natural (EK071G) MW32, RN13030126, RN13030715, SW20, SW36, BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**----**	----	----	**20-Jun-2023**	12-Jun-2023	✘
Clear Plastic Bottle - Natural (EK071G) RN13030127, RN13030697	**10-Jun-2023**	**----**	----	----	**21-Jun-2023**	12-Jun-2023	✘
Clear Plastic Bottle - Natural (EK071G) ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, BD04_1206, SD04_1206	**12-Jun-2023**	**----**	----	----	**20-Jun-2023**	14-Jun-2023	✘
Clear Plastic Bottle - Natural (EK071G) L005-B01, MW69, MW70, MW75, MW76, MW79	**13-Jun-2023**	**----**	----	----	**20-Jun-2023**	15-Jun-2023	✘
Clear Plastic Bottle - Natural (EK071G) Bore X, L012-B01, MW06, MW26, MW27, MW59, MW97, BD05_1406, SD05_1406	**14-Jun-2023**	**----**	----	----	**20-Jun-2023**	16-Jun-2023	✘
Clear Plastic Bottle - Natural (EK071G) MW60	**14-Jun-2023**	**----**	----	----	**22-Jun-2023**	16-Jun-2023	✘

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) MW80, DRD, PW2	**06-Jun-2023**	**23-Jun-2023**	03-Dec-2023	✓	**28-Jun-2023**	03-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW68, MW72, MW73, SW12, SW22, SW40, RB01_0706, FB01_0706	**07-Jun-2023**	**23-Jun-2023**	04-Dec-2023	✓	**28-Jun-2023**	04-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**23-Jun-2023**	05-Dec-2023	✓	**28-Jun-2023**	05-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD01_0906, SD01_0906	**09-Jun-2023**	**22-Jun-2023**	06-Dec-2023	✓	**26-Jun-2023**	06-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW31, MW43, RN13030692, RN13030698, RB01_0906, FB01_0906	**09-Jun-2023**	**23-Jun-2023**	06-Dec-2023	✓	**28-Jun-2023**	06-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**22-Jun-2023**	07-Dec-2023	✓	**26-Jun-2023**	07-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW32, RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36	**10-Jun-2023**	**23-Jun-2023**	07-Dec-2023	✓	**28-Jun-2023**	07-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_1206, SD04_1206	**12-Jun-2023**	**22-Jun-2023**	09-Dec-2023	✓	**26-Jun-2023**	09-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, RB01_1206, FB01_1206	**12-Jun-2023**	**23-Jun-2023**	09-Dec-2023	✓	**28-Jun-2023**	09-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_1306	**13-Jun-2023**	**22-Jun-2023**	10-Dec-2023	✓	**26-Jun-2023**	10-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01, MW69, MW70, MW75, MW76, MW79, RB01_1306	**13-Jun-2023**	**23-Jun-2023**	10-Dec-2023	✓	**28-Jun-2023**	10-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids - Continued							
HDPE (no PTFE) (EP231X-SUT)							
BD05_1406, SD05_1406	**14-Jun-2023**	**22-Jun-2023**	11-Dec-2023	✓	**26-Jun-2023**	11-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT)							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97	**14-Jun-2023**	**23-Jun-2023**	11-Dec-2023	✓	**28-Jun-2023**	11-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) MW80, DRD, PW2	**06-Jun-2023**	**23-Jun-2023**	03-Dec-2023	✓	**28-Jun-2023**	03-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW68, MW72, MW73, SW12, SW22, SW40, RB01_0706, FB01_0706	**07-Jun-2023**	**23-Jun-2023**	04-Dec-2023	✓	**28-Jun-2023**	04-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**23-Jun-2023**	05-Dec-2023	✓	**28-Jun-2023**	05-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD01_0906, SD01_0906	**09-Jun-2023**	**22-Jun-2023**	06-Dec-2023	✓	**26-Jun-2023**	06-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW31, MW43, RN13030692, RN13030698, RB01_0906, FB01_0906	**09-Jun-2023**	**23-Jun-2023**	06-Dec-2023	✓	**28-Jun-2023**	06-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**22-Jun-2023**	07-Dec-2023	✓	**26-Jun-2023**	07-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW32, RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36	**10-Jun-2023**	**23-Jun-2023**	07-Dec-2023	✓	**28-Jun-2023**	07-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_1206, SD04_1206	**12-Jun-2023**	**22-Jun-2023**	09-Dec-2023	✓	**26-Jun-2023**	09-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, RB01_1206, FB01_1206	**12-Jun-2023**	**23-Jun-2023**	09-Dec-2023	✓	**28-Jun-2023**	09-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_1306	**13-Jun-2023**	**22-Jun-2023**	10-Dec-2023	✓	**26-Jun-2023**	10-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01, MW69, MW70, MW75, MW76, MW79, RB01_1306	**13-Jun-2023**	**23-Jun-2023**	10-Dec-2023	✓	**28-Jun-2023**	10-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids - Continued							
HDPE (no PTFE) (EP231X-SUT)							
BD05_1406, SD05_1406	**14-Jun-2023**	**22-Jun-2023**	11-Dec-2023	✓	**26-Jun-2023**	11-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT)							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97	**14-Jun-2023**	**23-Jun-2023**	11-Dec-2023	✓	**28-Jun-2023**	11-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) MW80, DRD, PW2	**06-Jun-2023**	**23-Jun-2023**	03-Dec-2023	✓	**28-Jun-2023**	03-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW68, MW72, MW73, SW12, SW22, SW40, RB01_0706, FB01_0706	**07-Jun-2023**	**23-Jun-2023**	04-Dec-2023	✓	**28-Jun-2023**	04-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**23-Jun-2023**	05-Dec-2023	✓	**28-Jun-2023**	05-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD01_0906, SD01_0906	**09-Jun-2023**	**22-Jun-2023**	06-Dec-2023	✓	**26-Jun-2023**	06-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW31, MW43, RN13030692, RN13030698, RB01_0906, FB01_0906	**09-Jun-2023**	**23-Jun-2023**	06-Dec-2023	✓	**28-Jun-2023**	06-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**22-Jun-2023**	07-Dec-2023	✓	**26-Jun-2023**	07-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW32, RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36	**10-Jun-2023**	**23-Jun-2023**	07-Dec-2023	✓	**28-Jun-2023**	07-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_1206, SD04_1206	**12-Jun-2023**	**22-Jun-2023**	09-Dec-2023	✓	**26-Jun-2023**	09-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, RB01_1206, FB01_1206	**12-Jun-2023**	**23-Jun-2023**	09-Dec-2023	✓	**28-Jun-2023**	09-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_1306	**13-Jun-2023**	**22-Jun-2023**	10-Dec-2023	✓	**26-Jun-2023**	10-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01, MW69, MW70, MW75, MW76, MW79, RB01_1306	**13-Jun-2023**	**23-Jun-2023**	10-Dec-2023	✓	**28-Jun-2023**	10-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides - Continued							
HDPE (no PTFE) (EP231X-SUT)							
BD05_1406, SD05_1406	**14-Jun-2023**	**22-Jun-2023**	11-Dec-2023	✓	**26-Jun-2023**	11-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT)							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97	**14-Jun-2023**	**23-Jun-2023**	11-Dec-2023	✓	**28-Jun-2023**	11-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) MW80, DRD, PW2	**06-Jun-2023**	**23-Jun-2023**	03-Dec-2023	✓	**28-Jun-2023**	03-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW68, MW72, MW73, SW12, SW22, SW40, RB01_0706, FB01_0706	**07-Jun-2023**	**23-Jun-2023**	04-Dec-2023	✓	**28-Jun-2023**	04-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**23-Jun-2023**	05-Dec-2023	✓	**28-Jun-2023**	05-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD01_0906, SD01_0906	**09-Jun-2023**	**22-Jun-2023**	06-Dec-2023	✓	**26-Jun-2023**	06-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW31, MW43, RN13030692, RN13030698, RB01_0906, FB01_0906	**09-Jun-2023**	**23-Jun-2023**	06-Dec-2023	✓	**28-Jun-2023**	06-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**22-Jun-2023**	07-Dec-2023	✓	**26-Jun-2023**	07-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW32, RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36	**10-Jun-2023**	**23-Jun-2023**	07-Dec-2023	✓	**28-Jun-2023**	07-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_1206, SD04_1206	**12-Jun-2023**	**22-Jun-2023**	09-Dec-2023	✓	**26-Jun-2023**	09-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, RB01_1206, FB01_1206	**12-Jun-2023**	**23-Jun-2023**	09-Dec-2023	✓	**28-Jun-2023**	09-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_1306	**13-Jun-2023**	**22-Jun-2023**	10-Dec-2023	✓	**26-Jun-2023**	10-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01, MW69, MW70, MW75, MW76, MW79, RB01_1306	**13-Jun-2023**	**23-Jun-2023**	10-Dec-2023	✓	**28-Jun-2023**	10-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued							
HDPE (no PTFE) (EP231X-SUT)							
BD05_1406, SD05_1406	**14-Jun-2023**	**22-Jun-2023**	11-Dec-2023	✓	**26-Jun-2023**	11-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT)							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97	**14-Jun-2023**	**23-Jun-2023**	11-Dec-2023	✓	**28-Jun-2023**	11-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) MW80, DRD, PW2	**06-Jun-2023**	**23-Jun-2023**	03-Dec-2023	✓	**28-Jun-2023**	03-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW68, MW72, MW73, SW12, SW22, SW40, RB01_0706, FB01_0706	**07-Jun-2023**	**23-Jun-2023**	04-Dec-2023	✓	**28-Jun-2023**	04-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW09, MW11, MW78, Notch-V1, Notch-V2	**08-Jun-2023**	**23-Jun-2023**	05-Dec-2023	✓	**28-Jun-2023**	05-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD01_0906, SD01_0906	**09-Jun-2023**	**22-Jun-2023**	06-Dec-2023	✓	**26-Jun-2023**	06-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW31, MW43, RN13030692, RN13030698, RB01_0906, FB01_0906	**09-Jun-2023**	**23-Jun-2023**	06-Dec-2023	✓	**28-Jun-2023**	06-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD02_1006, BD03_1006, SD02_1006, SD03_1006	**10-Jun-2023**	**22-Jun-2023**	07-Dec-2023	✓	**26-Jun-2023**	07-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) MW32, RN13030126, RN13030127, RN13030697, RN13030715, SW20, SW36	**10-Jun-2023**	**23-Jun-2023**	07-Dec-2023	✓	**28-Jun-2023**	07-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) BD04_1206, SD04_1206	**12-Jun-2023**	**22-Jun-2023**	09-Dec-2023	✓	**26-Jun-2023**	09-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, L021-B01, MW40, MW42, MW49, MW74, PW1, SW02, SW41, RB01_1206, FB01_1206	**12-Jun-2023**	**23-Jun-2023**	09-Dec-2023	✓	**28-Jun-2023**	09-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) FB01_1306	**13-Jun-2023**	**22-Jun-2023**	10-Dec-2023	✓	**26-Jun-2023**	10-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01, MW69, MW70, MW75, MW76, MW79, RB01_1306	**13-Jun-2023**	**23-Jun-2023**	10-Dec-2023	✓	**28-Jun-2023**	10-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums - Continued							
HDPE (no PTFE) (EP231X-SUT)							
BD05_1406, SD05_1406	**14-Jun-2023**	**22-Jun-2023**	11-Dec-2023	✓	**26-Jun-2023**	11-Dec-2023	✓
HDPE (no PTFE) (EP231X-SUT)							
Bore X, L012-B01, MW06, MW26, MW27, MW59, MW60, MW97	**14-Jun-2023**	**23-Jun-2023**	11-Dec-2023	✓	**28-Jun-2023**	11-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	10	92	**10.87**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	7	62	**11.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	12	98	**12.24**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	10	100	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	10	91	**10.99**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	8	60	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	7	63	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	12	97	**12.37**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	77	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	10	96	**10.42**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	10	78	**12.82**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	12	107	**11.21**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	7	62	**11.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	13	88	**14.77**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	5	92	**5.43**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	4	62	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	12	98	**12.24**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	10	100	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	5	91	**5.49**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	60	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	63	**6.35**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	6	97	**6.19**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	4	77	**5.19**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	10	96	**10.42**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	6	78	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	12	107	**11.21**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	8	62	**12.90**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	9	60	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	7	88	**7.95**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	4	62	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	98	**6.12**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	5	100	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	5	91	**5.49**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Major Cations - Dissolved	ED093F	4	60	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	63	**6.35**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	6	97	**6.19**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	4	77	**5.19**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	6	78	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	107	**5.61**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	4	62	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	7	88	**7.95**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	4	62	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	98	**6.12**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	5	91	**5.49**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	63	**6.35**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	6	97	**6.19**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	77	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	6	78	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	107	**5.61**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	7	88	**7.95**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (Low Level)	EA025LL	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . Extra volume is used to counter the effect from saline water. This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

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Chain of Custody Record

Project No:	BC200153.03	Lab:	ALS
Project/Site:	CALLIDE QUATERLY MONITORING	Lab Quote No:	BN/344/21-V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)	Date Results Required:	5 day TAT
Phone:	0439 115 598	Sample Disposal After:	
Page:	1 of 4		
Number of Eskies:	8		

	Please Split Reports:	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS	Potable Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water	TOPA (EP231X-LL (TOPP)) + TOF (EP040)	SOIL: PFAS (EP231x)	HOLD
1	AA	Bore X	14/06/2023	w	1	1	1	1												
2	AA	ESC3	8/6/2023	w	1	1	1	1												
3	AA	ESC4	12/6/2023	w	1	1	1	1												
4	AB	L005-B01	13/6/2023	w	1	1	1	1												
5	AC	L006-B05	7/6/2023	w	1	1	1	1												
6	AD	L012-B01	14/6/2023	w	1	1	1	1												
7	AE	L021-B01	12/6/2023	w	1	1	1	1												
8	AA	MW06	14/6/2023	w	1	1	1	1												
9	AA	MW09	8/6/2023	w	1	1	1	1												
10	AA	MW11	8/6/2023	w	1	1	1	1												
11	AA	MW26	14/6/2023	w	1	1	1	1												
12	AA	MW27	14/6/2023	w	1	1	1	1												
13	AA	MW31	9/6/2023	w	1	1	1	1												
14	AA	MW32	10/6/2023	w	1	1	1	1												
15	AA	MW40	12/6/2023	w	1	1	1	1												
16	AA	MW42	12/6/2023	w	1	1	1	1												
17	AA	MW43	9/6/2023	w	1	1	1	1												
18	AA	MW49	12/6/2023	w	1	1	1	1												
19	AA	MW59	14/6/2023	w	1	1	1	1												
20	AA	MW60	14/6/2023	w	1	1	1	1												
21	AA	MW68	7/6/2023	w	1	1	1	1												

Relinquished By: Dan Papinczak
0407 611 133
Dan Papinczak
15-Jun-23

Received By
SIGNATURE
15-6-23
DATE 1625

Custody Seals Intact Y N
Sample
Metho

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

Reid SW
20/6/23
11:06

Environmental Division
Brisbane
Work Order Reference
EB2318365

Telephone : +61-7-3243 7222

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1 of 4

Chain of Custody Record

Project No:	BC200153.03	Lab:	ALS
Project/Site:	CALLIDE QUATERLY MONITORING	Lab Quote No:	BN/344/21-V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)	Date Results Required:	5 day TAT
Phone:	0439 115 598	Sample Disposal After:	
Page:	2 of 4		
Number of Eskies:	8		

		Please Split Reports:	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Dissolved Chloride low level (EA045-10g)	Ammonia (EK040)	Reactive P (EK071G)	Nitrate as Nitrate (NT-01)	Major Anions/Cations (NT-01 and NT02A)	Dissolved Fluoride (EN055-PG)	Total Metals by ICP-MS (EC026)	PFAS Suite (EP231X-SUM)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	PFAS (EP231S)	HOLD
22	AA		MW69	13/6/2023	W	1	1	1	1																					
23	AA		MW70	13/6/2023	W	1	1	1	1																					
24	AA		MW72	7/6/2023	W	1	1	1	1																					
25	AA		MW73	7/6/2023	W	1	1	1	1																					
26	AA		MW74	12/6/2023	W	1	1	1	1																					
27	AA		MW75	13/6/2023	W	1	1	1	1																					
28	AA		MW76	13/6/2023	W	1	1	1	1																					
29	AA		MW78	8/6/2023	W	1	1	1	1																					
30	AA		MW79	13/06/2023	W	1	1	1	1																					
31	AA		MW80	6/13/2023	W	1	1	1	1																					
32	AA		MW97	14/6/2023	W	1	1	1	1																					
33	AA		RN13030126	10/6/2023	W	1	1	1	1																					
34	AA		RN13030127	10/6/2023	W	1	1	1	1																					
35	AA		RN13030692	9/6/2023	W	1	1	1	1																					
36	AA		RN13030697	10/6/2023	W	1	1	1	1																					
37	AA		RN13030698	9/6/2023	W	1	1	1	1																					
38	AA		RN13030715	10/6/2023	W	1	1	1	1																					
39	AA		DRD	6/6/2023	W	1	1	1	1																					
40	AA		Notch-V1	8/6/2023	W	1	1	1	1																					
41	AA		Notch-V2	8/6/2023	W	1	1	1	1																					
42	AA		PW1	12/6/2023	W	1	1	1	1																					

Relinquished By:
Dan Papinczak
0407 611 133
Daniel Papinczak 15-Jun-23

Received By SW
SIGNATURE
DATE 16/6/23 1100

Custody Seals Intact Y N
Samples Received Chilled Y N
Method of Shipment

NOTES: Please report with CS Energy EDD format: ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

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epic

Chain of Custody Record

Project No:	BC200153.03	Lab:	ALS
Project/Site:	CALLIDE QUATERLY MONITORING	Lab Quote No:	BN/344/21-V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)	Date Results Required:	5 day TAT
Phone:	0439 115 598	Sample Disposal After:	
Page:	3 of 4		
Number of Eskies:	8		

	Please Split Reports:	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS	Potable Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water	TOPA (EP231X-LL (TOPP) + TOF (EP040)	SOIL PFAS (EP233X)	HOLD
43	AA	PW2	6/6/2023	w	1	1	1	1												
44	AA	SW02	12/6/2023	w	1	1	1	1												
45	AA	SW12	7/6/2023	w	1	1	1	1												
46	AA	SW20	10/6/2023	w	1	1	1	1												
47	AA	SW22	7/6/2023	w	1	1	1	1												
48	AA	SW36	10/6/2023	w	1	1	1	1												
49	AA	SW40	7/6/2023	w	1	1	1	1												
50	AA	SW41	12/6/2023	w	1	1	1	1												
51	AA	RB01_0706	7/6/2023	w	1	1	1	1												
52	AA	RB01_0906	9/6/2023	w	1	1	1	1												
53	AA	RB01_1206	12/6/2023	w	1	1	1	1												
54	AA	RB01_1306	13/6/2023	w	1	1	1	1												
55	AA	FB01_0706	7/6/2023	w	1	1	1	1												
56	AA	FB01_0906	9/6/2023	w	1	1	1	1												
57	AA	FB01_1206	12/6/2023	w	1	1	1	1												
58	AA	FB01_1306	13/6/2023	w	1	1	1	1												
59	AA	BD01_0906	9/6/2023	w	1	1	1	1												
60	AA	BD02_1006	10/6/2023	w	1	1	1	1												
61	AA	BD03_1006	10/6/2023	w	1	1	1	1												
62	AA	BD04_1206	12/6/2023	w	1	1	1	1												
63	AA	BD05_1406	14/6/2023	w	1	1	1	1												

Relinquished By: Dan Papinczak 0407 611 133	Dan Papinczak 15-Jun-23	Received By SIGNATURE	DATE 19.6
Custody Seals Intact		Y	N
Samples Received Chilled		Y	N
Method of Shipment			

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
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Rec'd SW
20/6/23
1100

epic

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE QUATERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	4 of 4
Number of Eskies:	8

Lab:	Please send to Eurofins
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

	Please Split Reports:	SAMPLE ID	DATE	MATRIX	50ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS	Potable Water: pH (EA005P)	Potable Water: EC (EA010P)	Potable Water: TDS - Standard (EA015H)	Potable Water: Reactive P (EK071G)	Potable Water: Major Anions/Cations (NT-01 and NT02A)	Potable Water: Ionic Balance (EN055-PG)	Potable Water: PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water: pH (EA005P)	Bore Water: EC (EA010P)	Bore Water: TDS - Standard (EA015H)	Bore Water: Suspended Solids - Low Level (EA025H)	Bore Water: Ammonia (EK055G)	Bore Water: Reactive P (EK071G)	Bore Water: Nitrite and Nitrate (NT-04)	Bore Water: Major Anions/Cations (NT-01 and NT02A)	Bore Water: Ionic Balance (EN055-PG)	Bore Water: Total Metals (Ca and Mn) (EG020T)	Bore Water: PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	SOIL: PFAS (EP231X)	HOLD
64	AA	SD01_0906	9/6/2023	W	1	1	1	1																						
65	AA	SD02_1006	10/6/2023	W	1	1	1	1																						
66	AA	SD03_1006	10/6/2023	W	1	1	1	1																						
67	AA	SD04_1206	12/6/2023	W	1	1	1	1																						
68	AA	SD05_1406	14/6/2023	W	1	1	1	1																						

Relinquished By:		Received By:	1150
Dan Papinczak		SIGNATURE:	
0407 611 133	15-Jun-23	DATE:	15.6.23

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275

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email CSEnergyEnvironmentData@csenergy.com.au

CERTIFICATE OF ANALYSIS

Work Order	: **EB2328001**	Page	: 1 of 41
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02 Callide Quarterly Monitoring	Date Samples Received	: 12-Sep-2023 10:30
Order number	: ----	Date Analysis Commenced	: 13-Sep-2023
C-O-C number	: ----	Issue Date	: 21-Sep-2023 19:12
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V4		
No. of samples received	: 50		
No. of samples analysed	: 50		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- It is recognised that EK059G (Nitrite + Nitrate) is less than EK057G (Nitrite) for sample SW22 (EB2328001-039). However, the difference is within experimental variation of the methods.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- The presence of high SO4 may bias the EC low for some samples.
- TDS by method EA-015 may bias high for some samples due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- EP231X-SUT PFAS Super Ultra Trace: Sample 'MW84' (EB2328001_023) required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP231X-SUT PFAS Super Ultra Trace: The LOR values for particular analytes have been raised in particular samples due to the presence of sample matrix interference.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DRD	ESC4	L005-B01	L006-B05	L012-B01
				Sampling date / time	04-Sep-2023 00:00	06-Sep-2023 00:00	07-Sep-2023 00:00	05-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-001	EB2328001-002	EB2328001-003	EB2328001-004	EB2328001-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.82	7.55	7.90	7.07	7.22
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		11200	9280	2070	4400	1330
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		10000	8220	1350	3360	1020
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		20	<5	<5	198	<5
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		74	190	305	134	168
Total Alkalinity as CaCO3	----	1	mg/L		74	190	305	134	168
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2620	1850	63	138	84
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		3020	2490	482	1270	290
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		899	542	125	341	99
Magnesium	7439-95-4	1	mg/L		398	571	66	186	50
Sodium	7440-23-5	1	mg/L		1450	951	256	174	102
Potassium	7440-09-7	1	mg/L		40	<1	3	2	2
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		0.242	0.558	<0.001	0.056	0.009
Iron	7439-89-6	0.05	mg/L		0.45	0.05	<0.05	140	<0.05
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		1.0	0.7	0.2	0.1	0.2
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.08	0.12	<0.01	0.17	0.16
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.01	<0.01	1.33	3.79	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DRD	ESC4	L005-B01	L006-B05	L012-B01
				Sampling date / time	04-Sep-2023 00:00	06-Sep-2023 00:00	07-Sep-2023 00:00	05-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-001	EB2328001-002	EB2328001-003	EB2328001-004	EB2328001-005
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.01**	<0.01	**1.33**	**3.79**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.01**	<0.01	**0.01**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**141**	**112**	**21.0**	**41.4**	**13.3**
ø Total Cations	----	0.01	meq/L		**142**	**115**	**22.9**	**39.9**	**13.5**
ø Ionic Balance	----	0.01	%		**0.17**	**1.25**	**4.28**	**1.76**	**0.96**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0157**	**0.0288**	**0.0024**	**0.0068**	**0.0017**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0037	**0.0261**	**0.0024**	**0.0073**	**0.0011**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0390**	**0.151**	**0.0212**	**0.0803**	**0.0126**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0016	**0.0028**	<0.0005	**0.0025**	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0229**	**0.0498**	**0.0570**	**0.130**	**0.0107**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.400	<0.0112	<0.0080	<0.0080	<0.0080
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0032	<0.0016	<0.0005	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0095	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0111	<0.0016	<0.0005	<0.0005	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0016	**0.0007**	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DRD	ESC4	L005-B01	L006-B05	L012-B01
				Sampling date / time	04-Sep-2023 00:00	06-Sep-2023 00:00	07-Sep-2023 00:00	05-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-001	EB2328001-002	EB2328001-003	EB2328001-004	EB2328001-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0039	<0.0039	<0.0005	<0.0005	<0.0040
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.001	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.001	<0.001	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.004	<0.001	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.001	<0.001	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0619**	**0.201**	**0.0782**	**0.210**	**0.0233**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0776**	**0.230**	**0.0813**	**0.217**	**0.0250**
^ Sum of PFAS	----	0.0002	µg/L		**0.0776**	**0.258**	**0.0837**	**0.227**	**0.0261**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**124**	**102**	**88.7**	**90.5**	**115**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DRD	ESC4	L005-B01	L006-B05	L012-B01
				Sampling date / time	04-Sep-2023 00:00	06-Sep-2023 00:00	07-Sep-2023 00:00	05-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-001	EB2328001-002	EB2328001-003	EB2328001-004	EB2328001-005
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**128**	**103**	**93.6**	**100**	**127**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	L021-B01	MW09	MW32	MW40	MW42
			Sampling date / time	07-Sep-2023 00:00	06-Sep-2023 00:00	07-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328001-006	EB2328001-007	EB2328001-008	EB2328001-009	EB2328001-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.24	7.62	7.88	8.26	8.19
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	630	12600	7060	8970	10800
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	410	9270	5000	6630	8010
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	426	<5	8	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	458	399	621	322
Total Alkalinity as CaCO3	----	1	mg/L	125	458	399	621	322
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	9	1890	966	723	1630
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	120	3370	1590	2550	2800
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	41	324	402	226	305
Magnesium	7439-95-4	1	mg/L	21	634	436	505	490
Sodium	7440-23-5	1	mg/L	65	1920	242	1030	1500
Potassium	7440-09-7	1	mg/L	1	1	<1	<1	1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	<0.001	0.422	0.826	0.556	4.17
Iron	7439-89-6	0.05	mg/L	<0.05	2.34	0.15	<0.05	0.17
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.1	0.8	0.6	0.6	1.4
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.02	0.03	0.08	0.02
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	0.03	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.28	0.34	<0.01	0.02	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L021-B01	MW09	MW32	MW40	MW42
				Sampling date / time	07-Sep-2023 00:00	06-Sep-2023 00:00	07-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-006	EB2328001-007	EB2328001-008	EB2328001-009	EB2328001-010
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.28**	**0.34**	<0.01	**0.05**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	**0.03**	**0.01**	**0.04**	**0.02**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**6.07**	**144**	**72.9**	**99.4**	**119**
ø Total Cations	----	0.01	meq/L		**6.63**	**152**	**66.5**	**97.6**	**121**
ø Ionic Balance	----	0.01	%		**4.39**	**2.82**	**4.64**	**0.89**	**0.61**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0012**	**0.0163**	**0.762**	**0.0605**	**0.0185**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0014**	**0.0070**	**1.11**	**0.0375**	**0.0103**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0145**	**0.0382**	**4.15**	**0.251**	**0.0410**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	**0.0011**	**0.144**	**0.0110**	**0.0009**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0536**	**0.0535**	**1.21**	**0.390**	**0.0344**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0079	**0.249**	<0.0080	<0.0126
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0016	**0.328**	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0016	**0.174**	<0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0016	**1.32**	<0.0036	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0016	**0.274**	<0.0016	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0016
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0016
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L021-B01	MW09	MW32	MW40	MW42
				Sampling date / time	07-Sep-2023 00:00	06-Sep-2023 00:00	07-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-006	EB2328001-007	EB2328001-008	EB2328001-009	EB2328001-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0040	<0.0005	<0.0005	<0.0039
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.004	<0.001	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.004	<0.001	<0.001	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.004	<0.001	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.004	<0.001	<0.001	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	**0.001**	**0.006**	**0.148**	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0681**	**0.0917**	**5.36**	**0.641**	**0.0754**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0693**	**0.109**	**8.47**	**0.850**	**0.0939**
^ Sum of PFAS	----	0.0002	µg/L		**0.0707**	**0.117**	**9.73**	**0.898**	**0.105**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**99.8**	**110**	**82.2**	**87.1**	**93.6**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L021-B01	MW09	MW32	MW40	MW42
				Sampling date / time	07-Sep-2023 00:00	06-Sep-2023 00:00	07-Sep-2023 00:00	06-Sep-2023 00:00	06-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-006	EB2328001-007	EB2328001-008	EB2328001-009	EB2328001-010
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**104**	**112**	**97.4**	**112**	**116**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW43	MW49	MW59	MW68	MW72
			Sampling date / time	07-Sep-2023 00:00	06-Sep-2023 00:00	09-Sep-2023 00:00	07-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328001-011	EB2328001-012	EB2328001-013	EB2328001-014	EB2328001-015
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.98	7.79	8.45	7.93	8.13
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	7640	14800	11400	9500	831
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	6740	11500	6950	6800	508
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	19	5	<5	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	46	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	404	497	743	564	158
Total Alkalinity as CaCO3	----	1	mg/L	404	497	789	564	158
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1250	836	679	721	50
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1700	4680	3200	2630	132
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	306	437	67	257	58
Magnesium	7439-95-4	1	mg/L	542	618	278	407	29
Sodium	7440-23-5	1	mg/L	345	2030	2200	1230	68
Potassium	7440-09-7	1	mg/L	<1	3	<1	1	4
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.114	2.19	0.002	0.313	0.036
Iron	7439-89-6	0.05	mg/L	0.57	2.64	<0.05	0.41	<0.05
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	0.3	0.7	0.4	0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.40	0.03	0.04	0.06	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.02	0.62	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW43	MW49	MW59	MW68	MW72
				Sampling date / time	07-Sep-2023 00:00	06-Sep-2023 00:00	09-Sep-2023 00:00	07-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-011	EB2328001-012	EB2328001-013	EB2328001-014	EB2328001-015
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.02**	**0.62**	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	**0.05**	**0.01**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**82.0**	**159**	**120**	**100**	**7.92**
ø Total Cations	----	0.01	meq/L		**74.9**	**161**	**122**	**99.8**	**8.34**
ø Ionic Balance	----	0.01	%		**4.57**	**0.53**	**0.72**	**0.31**	**2.58**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.275**	**0.164**	**0.0516**	**0.0543**	**0.0007**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.321**	**0.212**	**0.0446**	**0.0406**	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**1.34**	**2.13**	**0.313**	**0.239**	**0.0019**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0201**	**0.0219**	**0.0104**	**0.0080**	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.126**	**0.473**	**0.105**	**0.289**	**0.0041**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.121	<0.0554	**0.0525**	<0.0078	<0.0078
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0903**	**0.0106**	**0.0159**	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0372**	<0.0028	**0.0076**	<0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.312**	**0.0269**	**0.0628**	<0.0016	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0419**	**0.0037**	**0.0140**	<0.0016	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0016
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW43	MW49	MW59	MW68	MW72
				Sampling date / time	07-Sep-2023 00:00	06-Sep-2023 00:00	09-Sep-2023 00:00	07-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-011	EB2328001-012	EB2328001-013	EB2328001-014	EB2328001-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0005	<0.0005	<0.0005	<0.0039
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.001	<0.001	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.001	<0.001	<0.001	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.001	<0.001	<0.001	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.001**	**0.012**	**0.009**	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**1.47**	**2.60**	**0.418**	**0.528**	**0.0060**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**2.22**	**2.82**	**0.631**	**0.582**	**0.0067**
^ Sum of PFAS	----	0.0002	µg/L		**2.56**	**3.05**	**0.686**	**0.631**	**0.0067**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**100**	**95.4**	**78.5**	**114**	**94.9**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW43	MW49	MW59	MW68	MW72
				Sampling date / time	07-Sep-2023 00:00	06-Sep-2023 00:00	09-Sep-2023 00:00	07-Sep-2023 00:00	04-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-011	EB2328001-012	EB2328001-013	EB2328001-014	EB2328001-015
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**110**	**103**	**92.0**	**121**	**107**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW73	MW74	MW78	MW80	MW81
			Sampling date / time	05-Sep-2023 00:00	06-Sep-2023 00:00	05-Sep-2023 00:00	06-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328001-016	EB2328001-017	EB2328001-018	EB2328001-019	EB2328001-020
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.78	8.12	8.31	8.13	8.20
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	2490	3880	11300	4550	7160
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	2110	2610	7620	3280	6330
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	22	75	<5	38	<5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	21	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	212	777	563	262	405
Total Alkalinity as CaCO3	----	1	mg/L	212	777	584	262	405
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	120	538	1600	529	1250
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	627	532	2780	1020	1520
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	219	101	114	144	272
Magnesium	7439-95-4	1	mg/L	118	128	355	155	630
Sodium	7440-23-5	1	mg/L	136	734	2270	438	441
Potassium	7440-09-7	1	mg/L	4	7	2	4	<1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.092	0.044	0.061	5.40	0.051
Iron	7439-89-6	0.05	mg/L	0.73	1.14	<0.05	9.76	0.18
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.9	1.1	0.2	0.5
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.15	0.35	0.04
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW73	MW74	MW78	MW80	MW81
				Sampling date / time	05-Sep-2023 00:00	06-Sep-2023 00:00	05-Sep-2023 00:00	06-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-016	EB2328001-017	EB2328001-018	EB2328001-019	EB2328001-020
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	**0.01**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	<0.01	**0.02**	<0.01	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**24.4**	**41.7**	**123**	**45.0**	**77.0**
ø Total Cations	----	0.01	meq/L		**26.6**	**47.7**	**134**	**39.1**	**84.6**
ø Ionic Balance	----	0.01	%		**4.38**	**6.65**	**4.00**	**7.04**	**4.71**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0066**	**0.194**	**0.0200**	**0.0082**	**0.0137**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0069**	**0.0963**	**0.0082**	**0.0072**	**0.0098**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0548**	**0.354**	**0.0496**	**0.0440**	**0.0842**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0012**	**0.0063**	**0.0009**	<0.0005	**0.0036**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0707**	**0.0224**	**0.0375**	**0.0111**	**0.0637**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0078	**1.02**	<0.0079	<0.0079	<0.0081
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	**1.90**	<0.0016	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	**0.180**	<0.0016	<0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	**0.770**	<0.0016	<0.0016	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	**0.0144**	<0.0016	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	**0.0007**	**0.0005**	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0016
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW73	MW74	MW78	MW80	MW81
				Sampling date / time	05-Sep-2023 00:00	06-Sep-2023 00:00	05-Sep-2023 00:00	06-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-016	EB2328001-017	EB2328001-018	EB2328001-019	EB2328001-020
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0039	<0.0039	<0.0039	<0.0040
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.004	<0.004	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.004	<0.004	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.004	<0.004	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0016	<0.0016	<0.0005	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	**0.001**	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.126**	**0.376**	**0.0871**	**0.0551**	**0.148**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.132**	**4.46**	**0.107**	**0.0633**	**0.162**
^ Sum of PFAS	----	0.0002	µg/L		**0.140**	**4.56**	**0.117**	**0.0705**	**0.175**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**77.5**	**115**	**108**	**122**	**133**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW73	MW74	MW78	MW80	MW81
				Sampling date / time	05-Sep-2023 00:00	06-Sep-2023 00:00	05-Sep-2023 00:00	06-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-016	EB2328001-017	EB2328001-018	EB2328001-019	EB2328001-020
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		87.9	107	106	109	103

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW82	MW83	MW84	MW85	MW89
			Sampling date / time	09-Sep-2023 00:00	09-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	07-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328001-021	EB2328001-022	EB2328001-023	EB2328001-024	EB2328001-025
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.82	8.02	8.07	12.0	7.98
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	9980	8490	6080	10200	8250
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	8790	6840	4120	6490	6820
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	51	<5	132	20
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	841	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	100	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	160	304	464	<1	329
Total Alkalinity as CaCO3	----	1	mg/L	160	304	464	941	329
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2080	1390	779	364	1430
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2660	1900	1300	1740	2170
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	573	383	271	1160	333
Magnesium	7439-95-4	1	mg/L	554	440	481	<1	615
Sodium	7440-23-5	1	mg/L	1090	966	325	752	638
Potassium	7440-09-7	1	mg/L	3	<1	<1	39	<1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	11.0	2.03	0.011	0.046	0.034
Iron	7439-89-6	0.05	mg/L	0.09	0.84	<0.05	2.10	0.28
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.6	0.9	0.5	0.8	0.5
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.28	0.14	0.05	0.28	<0.01
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	0.01	0.23
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82	MW83	MW84	MW85	MW89
				Sampling date / time	09-Sep-2023 00:00	09-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	07-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-021	EB2328001-022	EB2328001-023	EB2328001-024	EB2328001-025
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	**0.01**	**0.23**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	**0.01**	<0.01	**0.02**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**122**	**88.6**	**62.2**	**75.5**	**97.6**
ø Total Cations	----	0.01	meq/L		**122**	**97.3**	**67.2**	**91.6**	**95.0**
ø Ionic Balance	----	0.01	%		**0.06**	**4.70**	**3.93**	**9.65**	**1.34**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0177**	**0.0157**	**2.12**	**0.0686**	**0.0526**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0069**	**0.0086**	**2.99**	**0.0670**	**0.0194**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0442**	**0.0620**	**21.5**	**0.395**	**0.274**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0012**	**0.0018**	**0.911**	**0.0180**	**0.0065**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0246**	**0.0728**	**12.0**	**0.161**	**0.0929**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0152	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0340	<0.0079	**0.694**	**0.0408**	**0.0256**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0016	**1.07**	**0.0020**	**0.0027**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0016	**0.670**	**0.0021**	<0.0030
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0016	**5.56**	**0.0028**	**0.0142**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0005	**1.13**	**0.0123**	**0.0040**
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0152	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0016	<0.0152	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0152	<0.0005	<0.0016
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0016	<0.0152	<0.0005	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0152	<0.0005	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82	MW83	MW84	MW85	MW89
				Sampling date / time	09-Sep-2023 00:00	09-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	07-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-021	EB2328001-022	EB2328001-023	EB2328001-024	EB2328001-025
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0040	<0.0379	<0.0005	<0.0039
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0152	<0.0005	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.038	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.038	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.004	<0.038	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.038	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0016	<0.0152	<0.0005	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0016	<0.0152	<0.0005	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.015	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.015	<0.002	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.015	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.015	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0688**	**0.135**	**33.5**	**0.556**	**0.367**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0865**	**0.150**	**44.7**	**0.685**	**0.466**
^ Sum of PFAS	----	0.0002	µg/L		**0.0946**	**0.161**	**48.6**	**0.770**	**0.492**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**132**	**110**	**85.0**	**113**	**117**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82	MW83	MW84	MW85	MW89
				Sampling date / time	09-Sep-2023 00:00	09-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	07-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-021	EB2328001-022	EB2328001-023	EB2328001-024	EB2328001-025
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**107**	**105**	**97.4**	**103**	**107**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW90	MW91	MW94	MW97	MW98
			Sampling date / time	07-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328001-026	EB2328001-027	EB2328001-028	EB2328001-029	EB2328001-030
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.11	8.08	8.25	7.91	8.58
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	8510	4310	10800	626	8230
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	7210	2990	7590	479	4590
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	<5	<5	16100	579
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	70
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	423	581	582	328	843
Total Alkalinity as CaCO3	----	1	mg/L	423	581	582	328	912
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1440	455	1610	24	95
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2320	893	2760	10	1940
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	318	199	109	24	30
Magnesium	7439-95-4	1	mg/L	599	317	329	34	95
Sodium	7440-23-5	1	mg/L	842	316	2200	82	1740
Potassium	7440-09-7	1	mg/L	<1	<1	2	<1	3
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.021	0.045	0.062	3.54	0.071
Iron	7439-89-6	0.05	mg/L	0.12	<0.05	0.06	26.7	1.59
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.5	0.5	1.1	2.0	2.6
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.06	0.02	0.07	0.07	0.04
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.04	<0.01	0.03	0.40
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90	MW91	MW94	MW97	MW98
				Sampling date / time	07-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-026	EB2328001-027	EB2328001-028	EB2328001-029	EB2328001-030
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.04**	<0.01	**0.03**	**0.40**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	<0.01	**0.02**	**0.09**	**0.02**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**104**	**46.3**	**123**	**7.34**	**74.9**
ø Total Cations	----	0.01	meq/L		**102**	**49.8**	**128**	**7.56**	**85.1**
ø Ionic Balance	----	0.01	%		**1.01**	**3.64**	**2.09**	**1.53**	**6.34**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0343**	**0.170**	**0.0182**	<0.0555	<0.0440
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0136**	**0.196**	**0.0100**	**0.0026**	**0.0071**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.112**	**1.15**	**0.0490**	**0.0106**	**0.0858**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0058**	**0.0528**	**0.0010**	<0.0005	**0.0021**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0657**	**0.191**	**0.0337**	**0.0205**	**0.0647**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.0154**	**0.124**	<0.0080	<0.0080	<0.0078
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	**0.0598**	<0.0016	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0020**	**0.0313**	<0.0016	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0016**	**0.167**	<0.0016	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0007**	**0.0463**	<0.0016	<0.0005	**0.0013**
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0005	<0.0016	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0005	<0.0016	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90	MW91	MW94	MW97	MW98
				Sampling date / time	07-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-026	EB2328001-027	EB2328001-028	EB2328001-029	EB2328001-030
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0039	<0.0005	<0.0040	<0.0040	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.001	<0.004	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.001	<0.004	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.001	<0.004	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0005	<0.0016	<0.0016	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	**0.002**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.178**	**1.34**	**0.0827**	**0.0311**	**0.150**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.232**	**1.94**	**0.101**	**0.0311**	**0.154**
^ Sum of PFAS	----	0.0002	µg/L		**0.251**	**2.19**	**0.112**	**0.0337**	**0.163**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**132**	**97.5**	**91.8**	**110**	**111**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90	MW91	MW94	MW97	MW98
				Sampling date / time	07-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-026	EB2328001-027	EB2328001-028	EB2328001-029	EB2328001-030
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**105**	**102**	**111**	**103**	**103**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	PW2	RN13030126	RN13030127	RN13030692	RN13030697
			Sampling date / time	04-Sep-2023 00:00	07-Sep-2023 00:00	06-Sep-2023 00:00	05-Sep-2023 00:00	06-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EB2328001-031	EB2328001-032	EB2328001-033	EB2328001-034	EB2328001-035
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.94	7.94	7.06	8.09	7.48
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	11200	610	827	542	1300
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	9050	400	518	318	771
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	9	<5	11900	<5	11700
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	94	146	268	147	262
Total Alkalinity as CaCO3	----	1	mg/L	94	146	268	147	262
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2310	16	17	20	23
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2960	109	183	77	260
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	678	35	37	36	101
Magnesium	7439-95-4	1	mg/L	423	17	30	17	29
Sodium	7440-23-5	1	mg/L	1310	46	66	55	131
Potassium	7440-09-7	1	mg/L	29	1	1	1	7
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.054	0.002	1.84	0.005	8.43
Iron	7439-89-6	0.05	mg/L	0.20	<0.05	131	0.05	37.8
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.3	0.1	0.3	0.1	0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.02	0.15	0.10	1.93
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.25
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.07	0.03	0.09	0.43
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	PW2	RN13030126	RN13030127	RN13030692	RN13030697
				Sampling date / time	04-Sep-2023 00:00	07-Sep-2023 00:00	06-Sep-2023 00:00	05-Sep-2023 00:00	06-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-031	EB2328001-032	EB2328001-033	EB2328001-034	EB2328001-035
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	**0.07**	**0.03**	**0.09**	**0.68**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	**0.03**	<0.01	**0.02**	**0.13**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**133**	**6.32**	**10.9**	**5.52**	**13.0**
ø Total Cations	----	0.01	meq/L		**126**	**5.17**	**7.21**	**5.61**	**13.3**
ø Ionic Balance	----	0.01	%		**2.73**	**10.0**	**20.2**	**0.79**	**0.97**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0207**	**0.0011**	<0.0290	<0.0005	<0.0325
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0071**	**0.0012**	**0.0027**	<0.0005	**0.0076**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0487**	**0.0137**	**0.0446**	**0.0060**	**0.0868**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0011**	<0.0005	**0.0007**	<0.0005	**0.0039**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0524**	**0.0119**	**0.0163**	**0.0210**	**0.0980**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.0290**	<0.0020	<0.0020	<0.0020	<0.0079
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0062**	<0.0005	<0.0005	<0.0005	**0.0058**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0073**	<0.0005	<0.0016	<0.0005	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.0107**	<0.0005	**0.0011**	<0.0005	**0.0038**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0027**	<0.0005	**0.0009**	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		**0.0018**	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0016

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	PW2	RN13030126	RN13030127	RN13030692	RN13030697
				Sampling date / time	04-Sep-2023 00:00	07-Sep-2023 00:00	06-Sep-2023 00:00	05-Sep-2023 00:00	06-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-031	EB2328001-032	EB2328001-033	EB2328001-034	EB2328001-035
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0005	<0.0005	<0.0005	<0.0040
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.004	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.001	<0.004	<0.004	<0.004
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.001	<0.001	<0.001	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.001	<0.001	<0.001	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0005	<0.0005	<0.0005	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	**0.012**	<0.001	**0.008**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.101**	**0.0256**	**0.0609**	**0.0270**	**0.185**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.178**	**0.0267**	**0.0749**	**0.0270**	**0.202**
^ Sum of PFAS	----	0.0002	µg/L		**0.188**	**0.0279**	**0.0783**	**0.0270**	**0.214**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**107**	**127**	**121**	**112**	**131**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	PW2	RN13030126	RN13030127	RN13030692	RN13030697
				Sampling date / time	04-Sep-2023 00:00	07-Sep-2023 00:00	06-Sep-2023 00:00	05-Sep-2023 00:00	06-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-031	EB2328001-032	EB2328001-033	EB2328001-034	EB2328001-035
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**106**	**102**	**101**	**100**	**100**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030698	RN13030715	SW12	SW22	SW45
				Sampling date / time	05-Sep-2023 00:00	05-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	09-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-036	EB2328001-037	EB2328001-038	EB2328001-039	EB2328001-040
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		8.08	8.20	8.29	8.03	8.61
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		2760	2960	3490	1500	1170
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		2060	2190	2390	1120	656
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	7	5	196	35
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	30
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		298	316	242	151	279
Total Alkalinity as CaCO3	----	1	mg/L		298	316	242	151	309
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		47	82	468	43	61
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		780	821	838	412	198
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		221	187	113	86	18
Magnesium	7439-95-4	1	mg/L		113	113	147	76	45
Sodium	7440-23-5	1	mg/L		230	330	417	115	194
Potassium	7440-09-7	1	mg/L		2	2	2	14	4
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		<0.001	0.028	0.197	0.957	0.102
Iron	7439-89-6	0.05	mg/L		<0.05	0.78	0.12	2.46	0.70
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.1	0.2	0.3	0.1	0.8
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.09	<0.01	0.05	0.13	0.18
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	0.05	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		11.2	7.27	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030698	RN13030715	SW12	SW22	SW45
				Sampling date / time	05-Sep-2023 00:00	05-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	09-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-036	EB2328001-037	EB2328001-038	EB2328001-039	EB2328001-040
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**11.2**	**7.27**	<0.01	**0.01**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.03**	**0.10**	<0.01	<0.01	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**28.9**	**31.2**	**38.2**	**15.5**	**13.0**
ø Total Cations	----	0.01	meq/L		**30.4**	**33.0**	**35.9**	**15.9**	**13.1**
ø Ionic Balance	----	0.01	%		**2.44**	**2.89**	**3.09**	**1.18**	**0.43**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0030	**0.0009**	**0.0111**	<0.0016	**0.0316**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0029**	<0.0006	**0.0096**	<0.0011	**0.0227**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0332**	**0.0035**	**0.0556**	**0.0166**	**0.114**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0007	<0.0005	**0.0085**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0048**	<0.0002	**0.0078**	**0.0163**	**0.122**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0079	<0.0020	<0.0081	<0.0078	**0.0721**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0016	**0.203**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0016	**0.0835**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0016	**0.131**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	**0.0476**
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	**0.0082**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030698	RN13030715	SW12	SW22	SW45
				Sampling date / time	05-Sep-2023 00:00	05-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	09-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-036	EB2328001-037	EB2328001-038	EB2328001-039	EB2328001-040
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0380**	**0.0035**	**0.0634**	**0.0329**	**0.236**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0380**	**0.0044**	**0.0745**	**0.0329**	**0.805**
^ Sum of PFAS	----	0.0002	µg/L		**0.0409**	**0.0044**	**0.0841**	**0.0329**	**0.844**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**122**	**118**	**109**	**122**	**115**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030698	RN13030715	SW12	SW22	SW45
				Sampling date / time	05-Sep-2023 00:00	05-Sep-2023 00:00	04-Sep-2023 00:00	04-Sep-2023 00:00	09-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-036	EB2328001-037	EB2328001-038	EB2328001-039	EB2328001-040
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**102**	**101**	**103**	**103**	**108**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD01_0509	BD02_0709	BD03_0709	BD04_0709	FB01_0509
				Sampling date / time	05-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00	05-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-041	EB2328001-042	EB2328001-043	EB2328001-044	EB2328001-045
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.90	7.69	7.26	7.48	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		799	6830	600	640	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		486	4860	346	358	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	<5	<5	<5	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		168	486	137	126	----
Total Alkalinity as CaCO3	----	1	mg/L		168	486	137	126	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		48	936	16	9	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		146	1720	96	119	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		58	522	40	38	----
Magnesium	7439-95-4	1	mg/L		30	587	19	18	----
Sodium	7440-23-5	1	mg/L		68	323	56	61	----
Potassium	7440-09-7	1	mg/L		4	<1	1	1	----
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		0.035	0.796	0.002	<0.001	----
Iron	7439-89-6	0.05	mg/L		<0.05	0.20	<0.05	<0.05	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.1	0.6	0.1	0.1	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.01	0.13	<0.01	<0.01	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		0.01	<0.01	0.07	0.28	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD01_0509	BD02_0709	BD03_0709	BD04_0709	FB01_0509
				Sampling date / time	05-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00	05-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-041	EB2328001-042	EB2328001-043	EB2328001-044	EB2328001-045
					Result	Result	Result	Result	Result
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.01**	<0.01	**0.07**	**0.28**	**----**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	<0.01	**0.02**	**0.01**	**----**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**8.47**	**77.7**	**5.78**	**6.06**	**----**
ø Total Cations	----	0.01	meq/L		**8.42**	**88.4**	**6.02**	**6.06**	**----**
ø Ionic Balance	----	0.01	%		**0.30**	**6.44**	**2.06**	**0.04**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0008	**0.464**	**0.0009**	**0.0009**	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	**0.592**	**0.0011**	**0.0012**	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0017**	**3.43**	**0.0123**	**0.0144**	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	**0.136**	<0.0005	**0.0005**	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0035**	**1.01**	**0.0100**	**0.0579**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0079	**0.161**	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	**0.220**	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	**0.133**	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	**0.865**	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	**0.194**	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD01_0509	BD02_0709	BD03_0709	BD04_0709	FB01_0509
				Sampling date / time	05-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00	05-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-041	EB2328001-042	EB2328001-043	EB2328001-044	EB2328001-045
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	**0.006**	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0052**	**4.44**	**0.0223**	**0.0723**	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0052**	**6.48**	**0.0232**	**0.0732**	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		**0.0052**	**7.21**	**0.0243**	**0.0749**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**117**	**71.0**	**127**	**114**	**127**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD01_0509	BD02_0709	BD03_0709	BD04_0709	FB01_0509
				Sampling date / time	05-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00	07-Sep-2023 00:00	05-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-041	EB2328001-042	EB2328001-043	EB2328001-044	EB2328001-045
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**101**	**105**	**97.1**	**99.7**	**97.9**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB01_0609	FB01_0709	RB01_0509	RB01_0609	RB01_0809
				Sampling date / time	06-Sep-2023 00:00	07-Sep-2023 00:00	05-Sep-2023 00:00	06-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-046	EB2328001-047	EB2328001-048	EB2328001-049	EB2328001-050
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB01_0609	FB01_0709	RB01_0509	RB01_0609	RB01_0809
				Sampling date / time	06-Sep-2023 00:00	07-Sep-2023 00:00	05-Sep-2023 00:00	06-Sep-2023 00:00	08-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EB2328001-046	EB2328001-047	EB2328001-048	EB2328001-049	EB2328001-050
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ **Sum of PFAS**	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**105**	**126**	**112**	**139**	**121**
13C8-PFOA	----	0.0005	%		**101**	**101**	**102**	**95.3**	**96.6**

Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2328001**	Page	: 1 of 18
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02 Callide Quarterly Monitoring	Date Samples Received	: 12-Sep-2023
Order number	: ----	Date Analysis Commenced	: 13-Sep-2023
C-O-C number	: ----	Issue Date	: 21-Sep-2023
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V4		
No. of samples received	: 50		
No. of samples analysed	: 50		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 5295545)									
EB2328001-025	MW89	EA005-P: pH Value	----	0.01	pH Unit	7.98	7.85	1.6	0% - 20%
EB2328001-016	MW73	EA005-P: pH Value	----	0.01	pH Unit	6.78	6.82	0.6	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5295552)									
ET2304481-004	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.50	7.53	0.4	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5295553)									
EB2328001-032	RN13030126	EA005-P: pH Value	----	0.01	pH Unit	7.94	8.01	0.9	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5296095)									
EB2328001-007	MW09	EA005-P: pH Value	----	0.01	pH Unit	7.62	7.52	1.3	0% - 20%
EB2328311-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.66	7.55	1.4	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5307822)									
EB2328436-006	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.45	7.53	1.1	0% - 20%
EB2328436-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.24	7.27	0.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5295546)									
EB2328001-025	MW89	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	8250	8100	1.8	0% - 20%
EB2328001-016	MW73	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2490	2490	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5295554)									
ET2304481-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	148	147	0.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5295555)									
EB2328001-032	RN13030126	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	610	609	0.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5296096)									
EB2328001-007	MW09	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	12600	12300	2.7	0% - 20%
EB2328311-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	495	486	1.8	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA010P: Conductivity by PC Titrator (QC Lot: 5307825)									
EB2328436-006	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	129	128	0.0	0% - 20%
EB2328436-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	114	113	0.0	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5294086)									
EB2328001-001	DRD	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	10000	10200	1.4	0% - 20%
EB2328001-011	MW43	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	6740	6520	3.3	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5294089)									
EB2328001-031	PW2	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	9050	9240	2.1	0% - 20%
EB2328001-021	MW82	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	8790	8780	0.1	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5294091)									
EB2328001-041	BD01_0509	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	486	511	5.1	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5294087)									
EB2328001-001	DRD	EA025H: Suspended Solids (SS)	----	5	mg/L	20	24	18.4	No Limit
EB2328001-011	MW43	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	5	0.0	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5294088)									
EB2328001-031	PW2	EA025H: Suspended Solids (SS)	----	5	mg/L	9	8	11.8	No Limit
EB2328001-021	MW82	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5294090)									
EB2328001-041	BD01_0509	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5295548)									
EB2328001-025	MW89	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	329	341	3.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	329	341	3.7	0% - 20%
EB2328001-016	MW73	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	212	209	1.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	212	209	1.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5295550)									
ET2304481-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	68	68	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	68	68	0.0	0% - 20%
ET2304486-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	110	110	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	110	110	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5295551)									
EB2328001-032	RN13030126	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5295551) - continued									
EB2328001-032	RN13030126	ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	146	148	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	146	148	0.8	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5296098)									
EB2328001-007	MW09	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	458	460	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	458	460	0.5	0% - 20%
EB2328311-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	59	57	3.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	59	57	3.3	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5307824)									
EB2328436-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	52	50	4.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	52	50	4.1	0% - 20%
EB2328436-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	40	39	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	40	39	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5296109)									
EB2328001-027	MW91	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	455	454	0.0	0% - 20%
EB2328001-019	MW80	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	529	527	0.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5296110)									
EB2328001-008	MW32	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	966	988	2.2	0% - 20%
EB2328001-044	BD04_0709	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	9	9	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5296117)									
EB2328001-040	SW45	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	61	61	0.0	0% - 20%
ET2304481-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1	1	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5296118)									
EB2328001-031	PW2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2310	2290	0.7	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5308301)									
EB2328474-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	824	813	1.3	0% - 20%
EB2319092-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	662	617	7.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5296107)									
EB2328001-027	MW91	ED045G: Chloride	16887-00-6	1	mg/L	893	909	1.9	0% - 20%
EB2328001-019	MW80	ED045G: Chloride	16887-00-6	1	mg/L	1020	1000	1.9	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 5296108)									
EB2328001-008	MW32	ED045G: Chloride	16887-00-6	1	mg/L	1590	1610	1.0	0% - 20%
EB2328001-044	BD04_0709	ED045G: Chloride	16887-00-6	1	mg/L	119	119	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5296113)									
EB2328001-040	SW45	ED045G: Chloride	16887-00-6	1	mg/L	198	196	1.2	0% - 20%
ET2304481-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	54	53	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5296114)									
EB2328001-031	PW2	ED045G: Chloride	16887-00-6	1	mg/L	2960	2950	0.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5308300)									
EB2328474-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	16600	16700	0.9	0% - 20%
EB2319092-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3700	3470	6.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5293498)									
EB2326880-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	218	216	0.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	6	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	62	62	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
EB2328001-003	L005-B01	ED093F: Calcium	7440-70-2	1	mg/L	125	120	4.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	66	64	3.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	256	253	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5293499)									
EB2328001-016	MW73	ED093F: Calcium	7440-70-2	1	mg/L	219	217	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	118	119	0.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	136	138	1.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EB2328001-034	RN13030692	ED093F: Calcium	7440-70-2	1	mg/L	36	35	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	17	17	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	55	56	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5294554)									
EB2328001-005	L012-B01	ED093F: Calcium	7440-70-2	1	mg/L	99	98	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	50	50	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	102	101	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EB2328104-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	2100	2110	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	14	14	0.0	0% - 50%
EG020T: Total Metals by ICP-MS (QC Lot: 5296020)									
EB2328001-034	RN13030692	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.005	0.005	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 5296020) - continued									
EB2328001-034	RN13030692	EG020A-T: Iron	7439-89-6	0.05	mg/L	0.05	0.06	0.0	No Limit
EB2328001-029	MW97	EG020A-T: Manganese	7439-96-5	0.001	mg/L	3.54	3.55	0.5	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	26.7	25.6	4.4	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 5296021)									
EB2328001-016	MW73	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.092	0.092	0.0	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.73	0.80	8.6	0% - 50%
EB2328001-009	MW40	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.556	0.550	1.1	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5296023)									
EB2328229-003	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2328183-001	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.074	0.073	0.0	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.66	1.54	7.4	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 5296035)									
EB2328001-002	ESC4	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.558	0.565	1.2	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.05	0.05	0.0	No Limit
EB2327664-002	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	432 µg/L	0.443	2.5	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1460 µg/L	1.47	0.0	0% - 20%
EK040P: Fluoride by PC Titrator (QC Lot: 5295547)									
EB2328001-025	MW89	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.5	0.5	0.0	No Limit
EB2328001-016	MW73	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5295556)									
ET2304481-004	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.2	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5295557)									
EB2328001-032	RN13030126	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5296097)									
EB2328001-007	MW09	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.8	0.8	0.0	No Limit
EB2328311-003	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5307823)									
EB2328547-003	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
EB2328436-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5306877)									
EB2328001-001	DRD	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.09	0.0	No Limit
EB2328001-011	MW43	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.40	0.40	0.0	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5306879)									
EB2328001-021	MW82	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.28	0.28	0.0	0% - 20%
EB2328001-031	PW2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.07	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5306881)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5306881) - continued									
EB2328001-041	BD01_0509	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5296105)									
EB2328001-027	MW91	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2328001-019	MW80	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5296106)									
EB2328001-008	MW32	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2328001-044	BD04_0709	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5296121)									
EB2328001-040	SW45	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ET2304481-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5296122)									
EB2328001-031	PW2	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5308302)									
EB2328474-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.08	0.08	0.0	No Limit
EB2319092-007	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.10	<0.10	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5306878)									
EB2328001-001	DRD	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.01	<0.01	0.0	No Limit
EB2328001-011	MW43	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5306880)									
EB2328001-021	MW82	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2328001-031	PW2	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5306882)									
EB2328001-041	BD01_0509	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.01	0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5296103)									
EB2328001-027	MW91	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2328001-019	MW80	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5296104)									
EB2328001-008	MW32	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	<0.01	0.0	No Limit
EB2328001-044	BD04_0709	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5296125)									
EB2328001-040	SW45	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ET2304481-003	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5296126)									
EB2328001-031	PW2	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5308303)									
EB2319092-007	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.32	0.25	23.5	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5295545)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.6	98.0	102
EA005P: pH by PC Titrator (QCLot: 5295552)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.4	98.0	102
EA005P: pH by PC Titrator (QCLot: 5295553)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.4	98.0	102
EA005P: pH by PC Titrator (QCLot: 5296095)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.6	98.0	102
EA005P: pH by PC Titrator (QCLot: 5307822)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.5	98.0	102
				----	7 pH Unit	99.6	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5295546)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	98.5	90.0	106
				<1	12890 µS/cm	98.6	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5295554)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	99.8	90.0	106
				<1	12890 µS/cm	99.9	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5295555)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	96.8	90.0	106
				<1	24800 µS/cm	101	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5296096)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	99.8	90.0	106
				<1	12890 µS/cm	96.1	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5307825)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	97.6	90.0	106
				<1	12890 µS/cm	98.7	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5294086)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5294086) - continued								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	108	88.0	112
				<10	2000 mg/L	94.3	80.9	118
				<10	2320 mg/L	107	81.5	119
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5294089)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	107	88.0	112
				<10	2000 mg/L	94.2	80.9	118
				<10	2320 mg/L	105	81.5	119
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5294091)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	104	88.0	112
				<10	2000 mg/L	97.0	80.9	118
				<10	2320 mg/L	106	81.5	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5294087)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	107	88.0	112
				<5	1000 mg/L	99.2	88.0	112
				<5	926 mg/L	99.5	84.8	116
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5294088)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	101	88.0	112
				<5	1000 mg/L	96.6	88.0	112
				<5	926 mg/L	97.5	84.8	116
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5294090)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	107	88.0	112
				<5	1000 mg/L	101	88.0	112
				<5	926 mg/L	101	84.8	116
ED037P: Alkalinity by PC Titrator (QCLot: 5295548)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	111	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5295550)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	102	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5295551)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	98.9	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5296098)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	95.4	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5307824)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	98.8	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5296109)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5296109) - continued								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.0	85.0	118
				<1	100 mg/L	93.7	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5296110)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.6	85.0	118
				<1	100 mg/L	93.8	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5296117)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	85.0	118
				<1	100 mg/L	102	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5296118)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.0	85.0	118
				<1	100 mg/L	100.0	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5308301)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.6	85.0	118
				<1	100 mg/L	100	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 5296107)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	90.0	115
				<1	1000 mg/L	96.7	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5296108)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.4	90.0	115
				<1	1000 mg/L	96.8	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5296113)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	90.0	115
				<1	1000 mg/L	108	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5296114)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	90.0	115
				<1	1000 mg/L	108	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5308300)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	103	90.0	115
				<1	1000 mg/L	99.6	90.0	115
ED093F: Dissolved Major Cations (QCLot: 5293498)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	111	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	70.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 5293499)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	108	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	114	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5294554)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.1	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.1	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5296020)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.8	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5296021)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.9	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5296023)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.7	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5296035)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.0	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.8	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 5295547)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	103	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5295556)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	101	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5295557)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	99.9	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5296097)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	98.4	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5307823)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	98.1	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5306877)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	90.2	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5306879)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5306879) - continued								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	88.6	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5306881)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	90.7	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5296105)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5296106)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.5	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5296121)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	100	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5296122)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.7	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5308302)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5306878)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.9	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5306880)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.7	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5306882)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.9	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5296103)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	109	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5296104)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	110	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5296125)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	102	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5296126)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	102	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5308303)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	97.6	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5293469)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	97.4	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	93.6	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	94.1	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	98.3	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5293469) - continued								
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	108	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	100	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5293474)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	111	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	118	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	102	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	99.5	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	118	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	99.7	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5293476)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	97.8	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	101	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	97.1	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	105	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	81.1	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	77.7	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5293469)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	101	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	114	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	105	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	98.8	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	98.8	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	92.4	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	95.2	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	90.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	96.4	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	92.8	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	113	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5293474)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	106	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	108	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	112	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	114	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	99.6	71.0	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5293474) - continued								
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	98.4	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	102	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	99.2	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	99.2	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	102	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	89.1	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5293476)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	95.8	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	93.2	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	95.2	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	101	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	102	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	100	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	101	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	91.2	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	90.8	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	83.6	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	75.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5293469)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	97.6	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	91.2	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	104	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	103	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	132	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	101	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	92.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5293474)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	103	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	95.7	68.0	141

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5293474) - continued								
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	90.7	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	106	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	96.5	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	100	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	91.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5293476)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	98.0	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	93.9	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	83.7	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	90.9	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	102	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	84.8	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	92.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5293469)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	106	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	95.2	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	90.0	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	95.8	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5293474)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	116	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	107	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	95.0	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	85.4	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5293476)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	102	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	96.0	64.0	140

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5293476) - continued								
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	90.0	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	75.0	53.1	133
EP231P: PFAS Sums (QCLot: 5293469)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5293474)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5293476)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5296109)							
EB2328001-025	MW89	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5296110)							
EB2328001-009	MW40	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5296117)							
ET2304481-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	101	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5308301)							
EB2319092-016	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 5296107)							
EB2328001-025	MW89	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5296108)							
EB2328001-009	MW40	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5296113)							
ET2304481-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	106	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5308300)							
EB2319092-016	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	91.6	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5296020)							
EB2328001-043	BD03_0709	EG020A-T: Manganese	7439-96-5	1 mg/L	105	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5296021)							
EB2328001-033	RN13030127	EG020A-T: Manganese	7439-96-5	1 mg/L	102	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5296023)							
EB2328267-001	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	95.6	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5296035)							
EB2328001-001	DRD	EG020A-T: Manganese	7439-96-5	1 mg/L	120	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5295547)							
EB2328001-028	MW94	EK040P: Fluoride	16984-48-8	5 mg/L	97.9	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5295556)							
EB2328001-040	SW45	EK040P: Fluoride	16984-48-8	5 mg/L	93.3	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5295557)							
EB2328001-026	MW90	EK040P: Fluoride	16984-48-8	5 mg/L	84.6	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5296097)							
EB2328001-001	DRD	EK040P: Fluoride	16984-48-8	5 mg/L	82.1	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5307823)							
EB2328436-002	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	91.7	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5306877)							
EB2328001-002	ESC4	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	98.3	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5306879)							
EB2328001-022	MW83	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	94.7	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5306881)							
EB2328001-042	BD02_0709	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	95.5	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5296105)							
EB2328001-025	MW89	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	92.4	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5296106)							
EB2328001-009	MW40	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	105	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5296121)							
ET2304481-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	105	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5308302)							
EB2319092-016	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	95.8	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5306878)							
EB2328001-002	ESC4	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	90.9	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5306880)							
EB2328001-022	MW83	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	90.6	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5306882)							
EB2328001-042	BD02_0709	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	90.7	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5296103)							
EB2328001-025	MW89	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	98.6	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5296104)							
EB2328001-009	MW40	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	113	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5296125)							
ET2304481-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	112	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5308303)							
EB2319092-016	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	98.8	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2328001**	Page	: 1 of 35
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BC200153.02 Callide Quarterly Monitoring	Date Samples Received	: 12-Sep-2023
Site	: ----	Issue Date	: 21-Sep-2023
Sampler	: DANIEL PAPINCZAK	No. of samples received	: 50
Order number	: ----	No. of samples analysed	: 50

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2328001--025	MW89	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2328001--009	MW40	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2319092--016	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2328001--025	MW89	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2328001--009	MW40	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
DRD		----	----	----	15-Sep-2023	04-Sep-2023	**11**
Clear Plastic Bottle - Natural							
PW2,	SW12,	----	----	----	18-Sep-2023	04-Sep-2023	**14**
SW22							
Clear Plastic Bottle - Natural							
MW72		----	----	----	19-Sep-2023	04-Sep-2023	**15**
Clear Plastic Bottle - Natural							
L006-B05		----	----	----	15-Sep-2023	05-Sep-2023	**10**
Clear Plastic Bottle - Natural							
RN13030692,	RN13030698,	----	----	----	18-Sep-2023	05-Sep-2023	**13**
RN13030715,	BD01_0509						
Clear Plastic Bottle - Natural							
MW73,	MW78	----	----	----	19-Sep-2023	05-Sep-2023	**14**
Clear Plastic Bottle - Natural							
ESC4,	MW09	----	----	----	15-Sep-2023	06-Sep-2023	**9**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural MW40, MW42, MW49, MW74, MW80	----	----	----	19-Sep-2023	06-Sep-2023	**13**
Clear Plastic Bottle - Natural RN13030127, RN13030697	----	----	----	20-Sep-2023	06-Sep-2023	**14**
Clear Plastic Bottle - Natural L005-B01, L021-B01, BD03_0709, BD04_0709	----	----	----	15-Sep-2023	07-Sep-2023	**8**
Clear Plastic Bottle - Natural MW90, RN13030126, BD02_0709	----	----	----	18-Sep-2023	07-Sep-2023	**11**
Clear Plastic Bottle - Natural MW32, MW43, MW68, MW89	----	----	----	19-Sep-2023	07-Sep-2023	**12**
Clear Plastic Bottle - Natural L012-B01	----	----	----	15-Sep-2023	08-Sep-2023	**7**
Clear Plastic Bottle - Natural MW91	----	----	----	18-Sep-2023	08-Sep-2023	**10**
Clear Plastic Bottle - Natural MW81, MW84, MW85, MW94, MW98	----	----	----	19-Sep-2023	08-Sep-2023	**11**
Clear Plastic Bottle - Natural MW97	----	----	----	20-Sep-2023	08-Sep-2023	**12**
Clear Plastic Bottle - Natural SW45	----	----	----	18-Sep-2023	09-Sep-2023	**9**
Clear Plastic Bottle - Natural MW59, MW82, MW83	----	----	----	19-Sep-2023	09-Sep-2023	**10**
EA015: Total Dissolved Solids dried at 180 ± 5 °C						
Clear Plastic Bottle - Natural DRD, MW72, PW2, SW12, SW22	----	----	----	13-Sep-2023	11-Sep-2023	**2**
Clear Plastic Bottle - Natural L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	----	----	----	13-Sep-2023	12-Sep-2023	**1**
EA025: Total Suspended Solids dried at 104 ± 2°C						

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA025: Total Suspended Solids dried at 104 ± 2°C - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
DRD, MW72, PW2, SW12, SW22	----	----	----	13-Sep-2023	11-Sep-2023	**2**
Clear Plastic Bottle - Natural						
L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	----	----	----	13-Sep-2023	12-Sep-2023	**1**
ED037P: Alkalinity by PC Titrator						
Clear Plastic Bottle - Natural						
MW72	----	----	----	19-Sep-2023	18-Sep-2023	**1**
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
DRD, MW72, PW2, SW12, SW22	----	----	----	13-Sep-2023	11-Sep-2023	**2**
Clear Plastic Bottle - Natural						
L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	----	----	----	13-Sep-2023	12-Sep-2023	**1**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
DRD, MW72, PW2, SW12, SW22	----	----	----	13-Sep-2023	06-Sep-2023	**7**
Clear Plastic Bottle - Natural						
L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	----	----	----	13-Sep-2023	07-Sep-2023	**6**
Clear Plastic Bottle - Natural						
ESC4, MW09, MW40, MW42, MW49, MW74, MW80	----	----	----	13-Sep-2023	08-Sep-2023	**5**
Clear Plastic Bottle - Natural						
RN13030127, RN13030697	----	----	----	20-Sep-2023	08-Sep-2023	**12**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK057G: Nitrite as N by Discrete Analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	----	----	----	13-Sep-2023	09-Sep-2023	**4**
Clear Plastic Bottle - Natural L012-B01, MW81, MW84, MW85, MW91, MW94, MW98	----	----	----	13-Sep-2023	10-Sep-2023	**3**
Clear Plastic Bottle - Natural MW97	----	----	----	20-Sep-2023	10-Sep-2023	**10**
Clear Plastic Bottle - Natural MW59, MW82, MW83, SW45	----	----	----	13-Sep-2023	11-Sep-2023	**2**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural DRD, MW72, PW2, SW12, SW22	----	----	----	13-Sep-2023	06-Sep-2023	**7**
Clear Plastic Bottle - Natural L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	----	----	----	13-Sep-2023	07-Sep-2023	**6**
Clear Plastic Bottle - Natural ESC4, MW09, MW40, MW42, MW49, MW74, MW80	----	----	----	13-Sep-2023	08-Sep-2023	**5**
Clear Plastic Bottle - Natural RN13030127, RN13030697	----	----	----	20-Sep-2023	08-Sep-2023	**12**
Clear Plastic Bottle - Natural L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	----	----	----	13-Sep-2023	09-Sep-2023	**4**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK071G: Reactive Phosphorus as P by discrete analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
L012-B01, MW81, MW84, MW85, MW91, MW94, MW98	----	----	----	13-Sep-2023	10-Sep-2023	**3**
Clear Plastic Bottle - Natural						
MW97	----	----	----	20-Sep-2023	10-Sep-2023	**10**
Clear Plastic Bottle - Natural						
MW59, MW82, MW83, SW45	----	----	----	13-Sep-2023	11-Sep-2023	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
	0				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	54	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	54	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) DRD	**04-Sep-2023**	**----**	----	----	**15-Sep-2023**	04-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**18-Sep-2023**	04-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW72	**04-Sep-2023**	**----**	----	----	**19-Sep-2023**	04-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) L006-B05	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	05-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**18-Sep-2023**	05-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW73, MW78	**05-Sep-2023**	**----**	----	----	**19-Sep-2023**	05-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) ESC4, MW09	**06-Sep-2023**	**----**	----	----	**15-Sep-2023**	06-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW40, MW42, MW49, MW74, MW80	**06-Sep-2023**	**----**	----	----	**19-Sep-2023**	06-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**20-Sep-2023**	06-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) L005-B01, L021-B01, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**15-Sep-2023**	07-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW90, RN13030126, BD02_0709	**07-Sep-2023**	**----**	----	----	**18-Sep-2023**	07-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW32, MW43, MW68, MW89	**07-Sep-2023**	**----**	----	----	**19-Sep-2023**	07-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) L012-B01	**08-Sep-2023**	**----**	----	----	**15-Sep-2023**	08-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW91	**08-Sep-2023**	**----**	----	----	**18-Sep-2023**	08-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW81, MW84, MW85, MW94, MW98	**08-Sep-2023**	**----**	----	----	**19-Sep-2023**	08-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW97	**08-Sep-2023**	**----**	----	----	**20-Sep-2023**	08-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P) SW45	**09-Sep-2023**	**----**	----	----	**18-Sep-2023**	09-Sep-2023	×
Clear Plastic Bottle - Natural (EA005-P)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator - Continued							
MW59, MW82, MW83	**09-Sep-2023**	**----**	----	**----**	**19-Sep-2023**	09-Sep-2023	✘

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) DRD	**04-Sep-2023**	**----**	----	----	**15-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**18-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW72	**04-Sep-2023**	**----**	----	----	**19-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) L006-B05	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**18-Sep-2023**	03-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW73, MW78	**05-Sep-2023**	**----**	----	----	**19-Sep-2023**	03-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) ESC4, MW09	**06-Sep-2023**	**----**	----	----	**15-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW40, MW42, MW49, MW74, MW80	**06-Sep-2023**	**----**	----	----	**19-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**20-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) L005-B01, L021-B01, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**15-Sep-2023**	05-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW90, RN13030126, BD02_0709	**07-Sep-2023**	**----**	----	----	**18-Sep-2023**	05-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW32, MW43, MW68, MW89	**07-Sep-2023**	**----**	----	----	**19-Sep-2023**	05-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) L012-B01	**08-Sep-2023**	**----**	----	----	**15-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW91	**08-Sep-2023**	**----**	----	----	**18-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW81, MW84, MW85, MW94, MW98	**08-Sep-2023**	**----**	----	----	**19-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW97	**08-Sep-2023**	**----**	----	----	**20-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P) SW45	**09-Sep-2023**	**----**	----	----	**18-Sep-2023**	07-Oct-2023	✓
Clear Plastic Bottle - Natural (EA010-P)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010P: Conductivity by PC Titrator - Continued							
MW59, MW82, MW83	**09-Sep-2023**	**----**	----	----	**19-Sep-2023**	07-Oct-2023	✓
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H) DRD, MW72, PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**13-Sep-2023**	11-Sep-2023	×
Clear Plastic Bottle - Natural (EA015H) L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	12-Sep-2023	×
Clear Plastic Bottle - Natural (EA015H) ESC4, MW09, MW40, MW42, MW49, MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**13-Sep-2023**	13-Sep-2023	✓
Clear Plastic Bottle - Natural (EA015H) L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**13-Sep-2023**	14-Sep-2023	✓
Clear Plastic Bottle - Natural (EA015H) L012-B01, MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**----**	----	----	**13-Sep-2023**	15-Sep-2023	✓
Clear Plastic Bottle - Natural (EA015H) MW59, MW82, MW83, SW45	**09-Sep-2023**	**----**	----	----	**13-Sep-2023**	16-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) DRD, MW72, PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**13-Sep-2023**	11-Sep-2023	×
Clear Plastic Bottle - Natural (EA025H) L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	12-Sep-2023	×
Clear Plastic Bottle - Natural (EA025H) ESC4, MW09, MW40, MW42, MW49, MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**13-Sep-2023**	13-Sep-2023	✓
Clear Plastic Bottle - Natural (EA025H) L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**13-Sep-2023**	14-Sep-2023	✓
Clear Plastic Bottle - Natural (EA025H) L012-B01, MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**----**	----	----	**13-Sep-2023**	15-Sep-2023	✓
Clear Plastic Bottle - Natural (EA025H) MW59, MW82, MW83, SW45	**09-Sep-2023**	**----**	----	----	**13-Sep-2023**	16-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) DRD	**04-Sep-2023**	**----**	----	----	**15-Sep-2023**	18-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW72	**04-Sep-2023**	**----**	----	----	**19-Sep-2023**	18-Sep-2023	×
Clear Plastic Bottle - Natural (ED037-P) PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**18-Sep-2023**	18-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) L006-B05	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	19-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**18-Sep-2023**	19-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW73, MW78	**05-Sep-2023**	**----**	----	----	**19-Sep-2023**	19-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) ESC4, MW09	**06-Sep-2023**	**----**	----	----	**15-Sep-2023**	20-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW40, MW42, MW49, MW74, MW80	**06-Sep-2023**	**----**	----	----	**19-Sep-2023**	20-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**20-Sep-2023**	20-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) L005-B01, L021-B01, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**15-Sep-2023**	21-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW90, RN13030126, BD02_0709	**07-Sep-2023**	**----**	----	----	**18-Sep-2023**	21-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW32, MW43, MW68, MW89	**07-Sep-2023**	**----**	----	----	**19-Sep-2023**	21-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) L012-B01	**08-Sep-2023**	**----**	----	----	**15-Sep-2023**	22-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW91	**08-Sep-2023**	**----**	----	----	**18-Sep-2023**	22-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW81, MW84, MW85, MW94, MW98	**08-Sep-2023**	**----**	----	----	**19-Sep-2023**	22-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW97	**08-Sep-2023**	**----**	----	----	**20-Sep-2023**	22-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P) SW45	**09-Sep-2023**	**----**	----	----	**18-Sep-2023**	23-Sep-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator - Continued							
MW59, MW82, MW83	**09-Sep-2023**	**----**	----	----	**19-Sep-2023**	23-Sep-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) DRD, MW72, PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**13-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (ED041G) L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	03-Oct-2023	✓
Clear Plastic Bottle - Natural (ED041G) ESC4, MW09, MW40, MW42, MW49, MW74, MW80	**06-Sep-2023**	**----**	----	----	**13-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Natural (ED041G) RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**20-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Natural (ED041G) L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**13-Sep-2023**	05-Oct-2023	✓
Clear Plastic Bottle - Natural (ED041G) L012-B01, MW81, MW84, MW85, MW91, MW94, MW98	**08-Sep-2023**	**----**	----	----	**13-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (ED041G) MW97	**08-Sep-2023**	**----**	----	----	**20-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (ED041G) MW59, MW82, MW83, SW45	**09-Sep-2023**	**----**	----	----	**13-Sep-2023**	07-Oct-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) DRD, MW72, PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**13-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (ED045G) L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	03-Oct-2023	✓
Clear Plastic Bottle - Natural (ED045G) ESC4, MW09, MW40, MW42, MW49, MW74, MW80	**06-Sep-2023**	**----**	----	----	**13-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Natural (ED045G) RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**20-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Natural (ED045G) L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**13-Sep-2023**	05-Oct-2023	✓
Clear Plastic Bottle - Natural (ED045G) L012-B01, MW81, MW84, MW85, MW91, MW94, MW98	**08-Sep-2023**	**----**	----	----	**13-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (ED045G) MW97	**08-Sep-2023**	**----**	----	----	**20-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (ED045G) MW59, MW82, MW83, SW45	**09-Sep-2023**	**----**	----	----	**13-Sep-2023**	07-Oct-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
DRD, MW72, PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**13-Sep-2023**	11-Sep-2023	×
Clear Plastic Bottle - Natural (ED093F)							
L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	12-Sep-2023	×
Clear Plastic Bottle - Natural (ED093F)							
ESC4, MW09, MW40, MW42, MW49, MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**13-Sep-2023**	13-Sep-2023	✓
Clear Plastic Bottle - Natural (ED093F)							
L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**13-Sep-2023**	14-Sep-2023	✓
Clear Plastic Bottle - Natural (ED093F)							
L012-B01, MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**----**	----	----	**15-Sep-2023**	15-Sep-2023	✓
Clear Plastic Bottle - Natural (ED093F)							
MW59, MW82, MW83, SW45	**09-Sep-2023**	**----**	----	----	**15-Sep-2023**	16-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
DRD	**04-Sep-2023**	**13-Sep-2023**	02-Mar-2024	✓	**15-Sep-2023**	02-Mar-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW72, PW2, SW12, SW22	**04-Sep-2023**	**13-Sep-2023**	02-Mar-2024	✓	**17-Sep-2023**	02-Mar-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
RN13030715	**05-Sep-2023**	**13-Sep-2023**	03-Mar-2024	✓	**15-Sep-2023**	03-Mar-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
L006-B05, MW73, MW78, RN13030692, RN13030698, BD01_0509	**05-Sep-2023**	**13-Sep-2023**	03-Mar-2024	✓	**17-Sep-2023**	03-Mar-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
ESC4	**06-Sep-2023**	**13-Sep-2023**	04-Mar-2024	✓	**15-Sep-2023**	04-Mar-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW09, MW40, MW42, MW49, MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**13-Sep-2023**	04-Mar-2024	✓	**17-Sep-2023**	04-Mar-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
BD04_0709	**07-Sep-2023**	**13-Sep-2023**	05-Mar-2024	✓	**15-Sep-2023**	05-Mar-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709	**07-Sep-2023**	**13-Sep-2023**	05-Mar-2024	✓	**17-Sep-2023**	05-Mar-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
L012-B01, MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**13-Sep-2023**	06-Mar-2024	✓	**17-Sep-2023**	06-Mar-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							
MW59, MW82, MW83, SW45	**09-Sep-2023**	**13-Sep-2023**	07-Mar-2024	✓	**17-Sep-2023**	07-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P) DRD	**04-Sep-2023**	**----**	----	----	**15-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**18-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW72	**04-Sep-2023**	**----**	----	----	**19-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) L006-B05	**05-Sep-2023**	**----**	----	----	**15-Sep-2023**	03-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**18-Sep-2023**	03-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW73, MW78	**05-Sep-2023**	**----**	----	----	**19-Sep-2023**	03-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) ESC4, MW09	**06-Sep-2023**	**----**	----	----	**15-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW40, MW42, MW49, MW74, MW80	**06-Sep-2023**	**----**	----	----	**19-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**20-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) L005-B01, L021-B01, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**15-Sep-2023**	05-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW90, RN13030126, BD02_0709	**07-Sep-2023**	**----**	----	----	**18-Sep-2023**	05-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW32, MW43, MW68, MW89	**07-Sep-2023**	**----**	----	----	**19-Sep-2023**	05-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) L012-B01	**08-Sep-2023**	**----**	----	----	**15-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW91	**08-Sep-2023**	**----**	----	----	**18-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW81, MW84, MW85, MW94, MW98	**08-Sep-2023**	**----**	----	----	**19-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW97	**08-Sep-2023**	**----**	----	----	**20-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P) SW45	**09-Sep-2023**	**----**	----	----	**18-Sep-2023**	07-Oct-2023	✓
Clear Plastic Bottle - Natural (EK040P)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK040P: Fluoride by PC Titrator - Continued							
MW59, MW82, MW83	**09-Sep-2023**	**----**	----	----	**19-Sep-2023**	07-Oct-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
DRD, MW72, PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**19-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**19-Sep-2023**	03-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
ESC4, MW09, MW40, MW42, MW49, MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**19-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**19-Sep-2023**	05-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
L012-B01, MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**----**	----	----	**19-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW59, MW82, MW83, SW45	**09-Sep-2023**	**----**	----	----	**19-Sep-2023**	07-Oct-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) DRD, MW72, PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**13-Sep-2023**	06-Sep-2023	×
Clear Plastic Bottle - Natural (EK057G) L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	07-Sep-2023	×
Clear Plastic Bottle - Natural (EK057G) ESC4, MW09, MW40, MW42, MW49, MW74, MW80	**06-Sep-2023**	**----**	----	----	**13-Sep-2023**	08-Sep-2023	×
Clear Plastic Bottle - Natural (EK057G) RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**20-Sep-2023**	08-Sep-2023	×
Clear Plastic Bottle - Natural (EK057G) L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**13-Sep-2023**	09-Sep-2023	×
Clear Plastic Bottle - Natural (EK057G) L012-B01, MW81, MW84, MW85, MW91, MW94, MW98	**08-Sep-2023**	**----**	----	----	**13-Sep-2023**	10-Sep-2023	×
Clear Plastic Bottle - Natural (EK057G) MW97	**08-Sep-2023**	**----**	----	----	**20-Sep-2023**	10-Sep-2023	×
Clear Plastic Bottle - Natural (EK057G) MW59, MW82, MW83, SW45	**09-Sep-2023**	**----**	----	----	**13-Sep-2023**	11-Sep-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) DRD, MW72, PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**19-Sep-2023**	02-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**19-Sep-2023**	03-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) ESC4, MW09, MW40, MW42, MW49, MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**19-Sep-2023**	04-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**19-Sep-2023**	05-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) L012-B01, MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**----**	----	----	**19-Sep-2023**	06-Oct-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW59, MW82, MW83, SW45	**09-Sep-2023**	**----**	----	----	**19-Sep-2023**	07-Oct-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) DRD, MW72, PW2, SW12, SW22	**04-Sep-2023**	**----**	----	----	**13-Sep-2023**	06-Sep-2023	×
Clear Plastic Bottle - Natural (EK071G) L006-B05, MW73, MW78, RN13030692, RN13030698, RN13030715, BD01_0509	**05-Sep-2023**	**----**	----	----	**13-Sep-2023**	07-Sep-2023	×
Clear Plastic Bottle - Natural (EK071G) ESC4, MW09, MW40, MW42, MW49, MW74, MW80	**06-Sep-2023**	**----**	----	----	**13-Sep-2023**	08-Sep-2023	×
Clear Plastic Bottle - Natural (EK071G) RN13030127, RN13030697	**06-Sep-2023**	**----**	----	----	**20-Sep-2023**	08-Sep-2023	×
Clear Plastic Bottle - Natural (EK071G) L005-B01, L021-B01, MW32, MW43, MW68, MW89, MW90, RN13030126, BD02_0709, BD03_0709, BD04_0709	**07-Sep-2023**	**----**	----	----	**13-Sep-2023**	09-Sep-2023	×
Clear Plastic Bottle - Natural (EK071G) L012-B01, MW81, MW84, MW85, MW91, MW94, MW98	**08-Sep-2023**	**----**	----	----	**13-Sep-2023**	10-Sep-2023	×
Clear Plastic Bottle - Natural (EK071G) MW97	**08-Sep-2023**	**----**	----	----	**20-Sep-2023**	10-Sep-2023	×
Clear Plastic Bottle - Natural (EK071G) MW59, MW82, MW83, SW45	**09-Sep-2023**	**----**	----	----	**13-Sep-2023**	11-Sep-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) PW2	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**15-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) DRD, MW72	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**18-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW12, SW22	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**19-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW78, RN13030692, RN13030698	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**15-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW73	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**18-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) RN13030715, BD01_0509, FB01_0509, RB01_0509	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**19-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**15-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW09, MW40, MW42, MW49	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**18-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0609, RB01_0609	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**19-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW89, MW90, RN13030126	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**15-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01, L021-B01, MW32, MW43, MW68	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**18-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD02_0709, BD03_0709, BD04_0709, FB01_0709	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**19-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**15-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L012-B01	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**18-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) RB01_0809	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**19-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW82, MW83	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**15-Sep-2023**	07-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids - Continued							
HDPE (no PTFE) (EP231X-SUT) MW59	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**18-Sep-2023**	07-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW45	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**19-Sep-2023**	07-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) PW2	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**15-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) DRD, MW72	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**18-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW12, SW22	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**19-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW78, RN13030692, RN13030698	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**15-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW73	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**18-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) RN13030715, BD01_0509, FB01_0509, RB01_0509	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**19-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**15-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW09, MW40, MW42, MW49	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**18-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0609, RB01_0609	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**19-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW89, MW90, RN13030126	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**15-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01, L021-B01, MW32, MW43, MW68	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**18-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD02_0709, BD03_0709, BD04_0709, FB01_0709	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**19-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**15-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L012-B01	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**18-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) RB01_0809	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**19-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW82, MW83	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**15-Sep-2023**	07-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids - Continued							
HDPE (no PTFE) (EP231X-SUT) MW59	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**18-Sep-2023**	07-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW45	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**19-Sep-2023**	07-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) PW2	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**15-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) DRD, MW72	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**18-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW12, SW22	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**19-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW78, RN13030692, RN13030698	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**15-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW73	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**18-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) RN13030715, BD01_0509, FB01_0509, RB01_0509	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**19-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**15-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW09, MW40, MW42, MW49	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**18-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0609, RB01_0609	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**19-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW89, MW90, RN13030126	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**15-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01, L021-B01, MW32, MW43, MW68	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**18-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD02_0709, BD03_0709, BD04_0709, FB01_0709	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**19-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**15-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L012-B01	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**18-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) RB01_0809	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**19-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW82, MW83	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**15-Sep-2023**	07-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides - Continued							
HDPE (no PTFE) (EP231X-SUT) MW59	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**18-Sep-2023**	07-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW45	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**19-Sep-2023**	07-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) PW2	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**15-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) DRD, MW72	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**18-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW12, SW22	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**19-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW78, RN13030692, RN13030698	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**15-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW73	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**18-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) RN13030715, BD01_0509, FB01_0509, RB01_0509	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**19-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**15-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW09, MW40, MW42, MW49	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**18-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0609, RB01_0609	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**19-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW89, MW90, RN13030126	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**15-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01, L021-B01, MW32, MW43, MW68	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**18-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD02_0709, BD03_0709, BD04_0709, FB01_0709	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**19-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**15-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L012-B01	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**18-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) RB01_0809	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**19-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW82, MW83	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**15-Sep-2023**	07-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued							
HDPE (no PTFE) (EP231X-SUT) MW59	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**18-Sep-2023**	07-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW45	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**19-Sep-2023**	07-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) PW2	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**15-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) DRD, MW72	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**18-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW12, SW22	**04-Sep-2023**	**14-Sep-2023**	02-Mar-2024	✓	**19-Sep-2023**	02-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW78, RN13030692, RN13030698	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**15-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L006-B05, MW73	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**18-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) RN13030715, BD01_0509, FB01_0509, RB01_0509	**05-Sep-2023**	**14-Sep-2023**	03-Mar-2024	✓	**19-Sep-2023**	03-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW74, MW80, RN13030127, RN13030697	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**15-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW09, MW40, MW42, MW49	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**18-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) FB01_0609, RB01_0609	**06-Sep-2023**	**14-Sep-2023**	04-Mar-2024	✓	**19-Sep-2023**	04-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW89, MW90, RN13030126	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**15-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01, L021-B01, MW32, MW43, MW68	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**18-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD02_0709, BD03_0709, BD04_0709, FB01_0709	**07-Sep-2023**	**14-Sep-2023**	05-Mar-2024	✓	**19-Sep-2023**	05-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW81, MW84, MW85, MW91, MW94, MW97, MW98	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**15-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) L012-B01	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**18-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) RB01_0809	**08-Sep-2023**	**14-Sep-2023**	06-Mar-2024	✓	**19-Sep-2023**	06-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW82, MW83	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**15-Sep-2023**	07-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums - Continued							
HDPE (no PTFE) (EP231X-SUT) MW59	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**18-Sep-2023**	07-Mar-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW45	**09-Sep-2023**	**14-Sep-2023**	07-Mar-2024	✓	**19-Sep-2023**	07-Mar-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	9	79	**11.39**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	5	44	**11.36**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	9	74	**12.16**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	8	68	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	8	57	**14.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	6	52	**11.54**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	5	44	**11.36**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	9	68	**13.24**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	54	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	8	67	**11.94**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	8	60	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	9	72	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	5	44	**11.36**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	5	44	**11.36**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	8	74	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	5	79	**6.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	10	74	**13.51**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	10	68	**14.71**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	5	57	**8.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	5	68	**7.35**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	3	54	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	10	67	**14.93**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	5	60	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	10	72	**13.89**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	9	44	**20.45**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	9	44	**20.45**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	4	74	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	5	74	**6.76**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	5	68	**7.35**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	5	57	**8.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Major Cations - Dissolved	ED093F	3	52	**5.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	5	68	**7.35**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	3	54	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	5	60	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	5	72	**6.94**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	4	74	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	74	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	5	57	**8.77**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	68	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	54	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	4	60	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	72	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	4	74	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2328001**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BC200153.02 Callide Quarterly Monitoring	Page	: 1 of 9
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V4)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DANIEL PAPINCZAK		

Dates

Date Samples Received	: 12-Sep-2023 10:30	Issue Date	: 12-Sep-2023
Client Requested Due Date	: 21-Sep-2023	Scheduled Reporting Date	: **21-Sep-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 8	Temperature	: 4.1°<->5.6°c - Ice present
Receipt Detail	: Esky	No. of samples received / analysed	: 50 / 50

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **Samples "SD01<->SD04 " have been forwarded to Eurofins , as requested. Please note that this will incur a freight forwarding fee.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025H Suspended Solids - Standard Level	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK071G Reactive Phosphorus by Discrete analyser	WATER - NT-04 Nitrite and Nitrate
EB2328001-001	04-Sep-2023 00:00	DRD	✓	✓	✓	✓	✓	✓	✓
EB2328001-002	06-Sep-2023 00:00	ESC4	✓	✓	✓	✓	✓	✓	✓
EB2328001-003	07-Sep-2023 00:00	L005-B01	✓	✓	✓	✓	✓	✓	✓
EB2328001-004	05-Sep-2023 00:00	L006-B05	✓	✓	✓	✓	✓	✓	✓
EB2328001-005	08-Sep-2023 00:00	L012-B01	✓	✓	✓	✓	✓	✓	✓
EB2328001-006	07-Sep-2023 00:00	L021-B01	✓	✓	✓	✓	✓	✓	✓
EB2328001-007	06-Sep-2023 00:00	MW09	✓	✓	✓	✓	✓	✓	✓
EB2328001-008	07-Sep-2023 00:00	MW32	✓	✓	✓	✓	✓	✓	✓
EB2328001-009	06-Sep-2023 00:00	MW40	✓	✓	✓	✓	✓	✓	✓
EB2328001-010	06-Sep-2023 00:00	MW42	✓	✓	✓	✓	✓	✓	✓
EB2328001-011	07-Sep-2023 00:00	MW43	✓	✓	✓	✓	✓	✓	✓
EB2328001-012	06-Sep-2023 00:00	MW49	✓	✓	✓	✓	✓	✓	✓
EB2328001-013	09-Sep-2023 00:00	MW59	✓	✓	✓	✓	✓	✓	✓
EB2328001-014	07-Sep-2023 00:00	MW68	✓	✓	✓	✓	✓	✓	✓
EB2328001-015	04-Sep-2023 00:00	MW72	✓	✓	✓	✓	✓	✓	✓
EB2328001-016	05-Sep-2023 00:00	MW73	✓	✓	✓	✓	✓	✓	✓
EB2328001-017	06-Sep-2023 00:00	MW74	✓	✓	✓	✓	✓	✓	✓
EB2328001-018	05-Sep-2023 00:00	MW78	✓	✓	✓	✓	✓	✓	✓
EB2328001-019	06-Sep-2023 00:00	MW80	✓	✓	✓	✓	✓	✓	✓
EB2328001-020	08-Sep-2023 00:00	MW81	✓	✓	✓	✓	✓	✓	✓
EB2328001-021	09-Sep-2023 00:00	MW82	✓	✓	✓	✓	✓	✓	✓
EB2328001-022	09-Sep-2023 00:00	MW83	✓	✓	✓	✓	✓	✓	✓
EB2328001-023	08-Sep-2023 00:00	MW84	✓	✓	✓	✓	✓	✓	✓
EB2328001-024	08-Sep-2023 00:00	MW85	✓	✓	✓	✓	✓	✓	✓
EB2328001-025	07-Sep-2023 00:00	MW89	✓	✓	✓	✓	✓	✓	✓
EB2328001-026	07-Sep-2023 00:00	MW90	✓	✓	✓	✓	✓	✓	✓
EB2328001-027	08-Sep-2023 00:00	MW91	✓	✓	✓	✓	✓	✓	✓
EB2328001-028	08-Sep-2023 00:00	MW94	✓	✓	✓	✓	✓	✓	✓
EB2328001-029	08-Sep-2023 00:00	MW97	✓	✓	✓	✓	✓	✓	✓
EB2328001-030	08-Sep-2023 00:00	MW98	✓	✓	✓	✓	✓	✓	✓
EB2328001-031	04-Sep-2023 00:00	PW2	✓	✓	✓	✓	✓	✓	✓
EB2328001-032	07-Sep-2023 00:00	RN13030126	✓	✓	✓	✓	✓	✓	✓
EB2328001-033	06-Sep-2023 00:00	RN13030127	✓	✓	✓	✓	✓	✓	✓
EB2328001-034	05-Sep-2023 00:00	RN13030692	✓	✓	✓	✓	✓	✓	✓
EB2328001-035	06-Sep-2023 00:00	RN13030697	✓	✓	✓	✓	✓	✓	✓

			WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025H Suspended Solids - Standard Level	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK071G Reactive Phosphorus by Discrete analyser	WATER - NT-04 Nitrite and Nitrate
EB2328001-036	05-Sep-2023 00:00	RN13030698	✓	✓	✓	✓	✓	✓	✓
EB2328001-037	05-Sep-2023 00:00	RN13030715	✓	✓	✓	✓	✓	✓	✓
EB2328001-038	04-Sep-2023 00:00	SW12	✓	✓	✓	✓	✓	✓	✓
EB2328001-039	04-Sep-2023 00:00	SW22	✓	✓	✓	✓	✓	✓	✓
EB2328001-040	09-Sep-2023 00:00	SW45	✓	✓	✓	✓	✓	✓	✓
EB2328001-041	05-Sep-2023 00:00	BD01_0509	✓	✓	✓	✓	✓	✓	✓
EB2328001-042	07-Sep-2023 00:00	BD02_0709	✓	✓	✓	✓	✓	✓	✓
EB2328001-043	07-Sep-2023 00:00	BD03_0709	✓	✓	✓	✓	✓	✓	✓
EB2328001-044	07-Sep-2023 00:00	BD04_0709	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
EB2328001-001	04-Sep-2023 00:00	DRD	✓	✓	✓
EB2328001-002	06-Sep-2023 00:00	ESC4	✓	✓	✓
EB2328001-003	07-Sep-2023 00:00	L005-B01	✓	✓	✓
EB2328001-004	05-Sep-2023 00:00	L006-B05	✓	✓	✓
EB2328001-005	08-Sep-2023 00:00	L012-B01	✓	✓	✓
EB2328001-006	07-Sep-2023 00:00	L021-B01	✓	✓	✓
EB2328001-007	06-Sep-2023 00:00	MW09	✓	✓	✓
EB2328001-008	07-Sep-2023 00:00	MW32	✓	✓	✓
EB2328001-009	06-Sep-2023 00:00	MW40	✓	✓	✓
EB2328001-010	06-Sep-2023 00:00	MW42	✓	✓	✓
EB2328001-011	07-Sep-2023 00:00	MW43	✓	✓	✓
EB2328001-012	06-Sep-2023 00:00	MW49	✓	✓	✓
EB2328001-013	09-Sep-2023 00:00	MW59	✓	✓	✓
EB2328001-014	07-Sep-2023 00:00	MW68	✓	✓	✓
EB2328001-015	04-Sep-2023 00:00	MW72	✓	✓	✓
EB2328001-016	05-Sep-2023 00:00	MW73	✓	✓	✓
EB2328001-017	06-Sep-2023 00:00	MW74	✓	✓	✓
EB2328001-018	05-Sep-2023 00:00	MW78	✓	✓	✓
EB2328001-019	06-Sep-2023 00:00	MW80	✓	✓	✓
EB2328001-020	08-Sep-2023 00:00	MW81	✓	✓	✓

			WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
EB2328001-021	09-Sep-2023 00:00	MW82	✓	✓	✓
EB2328001-022	09-Sep-2023 00:00	MW83	✓	✓	✓
EB2328001-023	08-Sep-2023 00:00	MW84	✓	✓	✓
EB2328001-024	08-Sep-2023 00:00	MW85	✓	✓	✓
EB2328001-025	07-Sep-2023 00:00	MW89	✓	✓	✓
EB2328001-026	07-Sep-2023 00:00	MW90	✓	✓	✓
EB2328001-027	08-Sep-2023 00:00	MW91	✓	✓	✓
EB2328001-028	08-Sep-2023 00:00	MW94	✓	✓	✓
EB2328001-029	08-Sep-2023 00:00	MW97	✓	✓	✓
EB2328001-030	08-Sep-2023 00:00	MW98	✓	✓	✓
EB2328001-031	04-Sep-2023 00:00	PW2	✓	✓	✓
EB2328001-032	07-Sep-2023 00:00	RN13030126	✓	✓	✓
EB2328001-033	06-Sep-2023 00:00	RN13030127	✓	✓	✓
EB2328001-034	05-Sep-2023 00:00	RN13030692	✓	✓	✓
EB2328001-035	06-Sep-2023 00:00	RN13030697	✓	✓	✓
EB2328001-036	05-Sep-2023 00:00	RN13030698	✓	✓	✓
EB2328001-037	05-Sep-2023 00:00	RN13030715	✓	✓	✓
EB2328001-038	04-Sep-2023 00:00	SW12	✓	✓	✓
EB2328001-039	04-Sep-2023 00:00	SW22	✓	✓	✓
EB2328001-040	09-Sep-2023 00:00	SW45	✓	✓	✓
EB2328001-041	05-Sep-2023 00:00	BD01_0509	✓	✓	✓
EB2328001-042	07-Sep-2023 00:00	BD02_0709	✓	✓	✓
EB2328001-043	07-Sep-2023 00:00	BD03_0709	✓	✓	✓
EB2328001-044	07-Sep-2023 00:00	BD04_0709	✓	✓	✓
EB2328001-045	05-Sep-2023 00:00	FB01_0509		✓	
EB2328001-046	06-Sep-2023 00:00	FB01_0609		✓	
EB2328001-047	07-Sep-2023 00:00	FB01_0709		✓	
EB2328001-048	05-Sep-2023 00:00	RB01_0509		✓	
EB2328001-049	06-Sep-2023 00:00	RB01_0609		✓	
EB2328001-050	08-Sep-2023 00:00	RB01_0809		✓	

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA005-P: pH by Auto Titrator							
BD01_0509	Clear Plastic Bottle - Natural	----	05-Sep-2023	12-Sep-2023	✘	----	----
BD02_0709	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
BD03_0709	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
BD04_0709	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----

DRD	Clear Plastic Bottle - Natural	----	04-Sep-2023	12-Sep-2023	✘	----	----
ESC4	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
L005-B01	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
L006-B05	Clear Plastic Bottle - Natural	----	05-Sep-2023	12-Sep-2023	✘	----	----
L012-B01	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
L021-B01	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
MW09	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
MW32	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
MW42	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
MW43	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
MW49	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
MW59	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW68	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	04-Sep-2023	12-Sep-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	05-Sep-2023	12-Sep-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
MW78	Clear Plastic Bottle - Natural	----	05-Sep-2023	12-Sep-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
MW81	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW82	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW83	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW84	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW85	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW89	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
MW90	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
MW91	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW94	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW97	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW98	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	04-Sep-2023	12-Sep-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
RN13030127	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	05-Sep-2023	12-Sep-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	05-Sep-2023	12-Sep-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	05-Sep-2023	12-Sep-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	04-Sep-2023	12-Sep-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	04-Sep-2023	12-Sep-2023	✘	----	----
SW45	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
EA015H: Total Dissolved Solids (High Level)							
DRD	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
EA025H: Suspended Solids (High Level)							
DRD	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
ED093F: Major Cations - Dissolved							
DRD	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
EK057G: Nitrite as N by Discrete Analyser							
BD01_0509	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
BD02_0709	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
BD03_0709	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
BD04_0709	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
ESC4	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
L005-B01	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----

L006-B05	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
L012-B01	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
L021-B01	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW09	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW32	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW42	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW43	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW49	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW59	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
MW68	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW78	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW81	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW82	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
MW83	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
MW84	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW85	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW89	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW90	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW91	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW94	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW97	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW98	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
RN13030127	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
SW45	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
EK071G: Reactive Phosphorus as P-By Discrete Analyser							
BD01_0509	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
BD02_0709	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
BD03_0709	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
BD04_0709	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
ESC4	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
L005-B01	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
L006-B05	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
L012-B01	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
L021-B01	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW09	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW32	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW42	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW43	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW49	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW59	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
MW68	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW78	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
MW81	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW82	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
MW83	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----
MW84	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW85	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----

MW89	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW90	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
MW91	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW94	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW97	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
MW98	Clear Plastic Bottle - Natural	----	10-Sep-2023	12-Sep-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	09-Sep-2023	12-Sep-2023	✘	----	----
RN13030127	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	08-Sep-2023	12-Sep-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	07-Sep-2023	12-Sep-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	06-Sep-2023	12-Sep-2023	✘	----	----
SW45	Clear Plastic Bottle - Natural	----	11-Sep-2023	12-Sep-2023	✘	----	----

Requested Deliverables

CS ENERGY ENVIRONMENTAL DATA

- *AU Certificate of Analysis - NATA (COA)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	CSEnergyEnvironmentData@csenergy.com.au
- Chain of Custody (CoC) (COC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ESDAT (ESDAT)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - XTab (XTAB)	Email	CSEnergyEnvironmentData@csenergy.com.au

DANIEL PAPINCZAK

- *AU Certificate of Analysis - NATA (COA)	Email	dpapinczak@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	dpapinczak@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	dpapinczak@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	dpapinczak@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	dpapinczak@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	dpapinczak@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	dpapinczak@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	dpapinczak@epicenvironmental.com.au

EPIC

- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au
- EDI Format - XTab (XTAB)	Email	epicenvironmental@esdat.com.au

INVOICES

- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au

LUKE AMIES

- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALIDE QUATERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	1 of 4
Number of Eskies:	6

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

Please Split Reports:	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-125ml Plastic (PFAS)	Other GLASS	Potable Water: pH (EA010P)	Potable Water: EC (EA010P)	Potable Water: TDS - Standard (EA015H)	Potable Water: Reactive P (EK071G)	Potable Water: Major Anions/Cations (NT-01 and NT02A)	Potable Water: Ionic Balance (ENO55-PO)	Potable Water: PFAS Suppor Ultra Trace Long Suite (EP233X-SO1)	Bore Water: pH (EA010P)	Bore Water: EC (EA010P)	Bore Water: TDS - Standard (EA015H)	Bore Water: Suspended Solids - Low Conc (EA037L)	Bore Water: Suspended (EA037H)	Bore Water: Reactive P (EK071G)	Bore Water: Nutrients Weekly (NT-04)	Bore Water: Major Anions/Cations (NT-01 and NT02A)	Bore Water: Ionic Balance (ENO55-PO)	Bore Water: Total Metals (Fe and Mn) (EM0-07)	Bore Water: PFAS Suppor Ultra Trace Long Suite (EP233X-SO1)	TOPA (EP231X-TL) (TOP) + TOF (EP234X)	SOIL: PFAS (EP231X)	HOLD
				Metals	Nutrients	Plastic (Unpreserved)	Plastic (PFAS)	GLASS																					
				3	3	1	1																						
AA	DRD	4/09/2023	W	1	1	1	1																						
AA	ESC4	6/09/2023	W	1	1	1	1																						
AB	L005-B01	7/09/2023	W	1	1	1	1																						
AC	L006-B05	5/09/2023	W	1	1	1	1																						
AD	L012-B01	8/09/2023	W	1	1	1	1																						
AE	L021-B01	7/09/2023	W	1	1	1	1																						
AA	MW09	6/09/2023	W	1	1	1	1																						
AA	MW32	7/09/2023	W	1	1	1	1																						
AA	MW40	6/09/2023	W	1	1	1	1																						
AA	MW42	6/09/2023	W	1	1	1	1																						
AA	MW43	7/09/2023	W	1	1	1	1																						
AA	MW49	6/09/2023	W	1	1	1	1																						
AA	MW59	9/09/2023	W	1	1	1	1																						
AA	MW68	7/09/2023	W	1	1	1	1																						
AA	MW72	5/09/2023	W	1	1	1	1																						
AA	MW73	5/09/2023	W	1	1	1	1																						
AA	MW74	6/09/2023	W	1	1	1	1																						
AA	MW78	5/09/2023	W	1	1	1	1																						
AA	MW80	6/09/2023	W	1	1	1	1																						
AA	MW81	8/09/2023	W	1	1	1	1																						

Relinquished By:	Received By: GLJ	Custody Seals Intact	Y N
Dan Papinczak	11.9.23 1030	Samples Received Chille	Y N
0439 115 598 10-Sep-23	SIGNATURE DATE	Method of Shipment	

NOTES: Please report with CS Energy EDD format; ENVMC_V4

Epic Environmental Pty Ltd ABN 54 169 570 275

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FD 12/9 1030

Environmental Division
Brisbane
Work Order Reference
EB2328001

Telephone : +61-7-3243 7222

Chain of Custody Record

Project No:	BC200153.03	Lab:	ALS
Project/Site:	CALLIDE QUATERLY MONITORING	Lab Quote No:	BN/344/21-V3
Project Manager:	Luke Arnies (larnies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)	Date Results Required:	5 day TAT
Phone:	0439 115 598	Sample Disposal After:	
Page:	2 of 4		
Number of Eskies:	6		

Please Split Reports:	SAMPLE ID	DATE	MATRIX	50ml Metals	60ml Nutrients	250 500ml Plastic (Unpreserved)	125 250ml Plastic (HNO3)	Other GLASS	Potable Water: pH (EA005P)	Potable Water: EC (EA010P)	Potable Water: TDS - Standard (EA015H)	Potable Water: Reactive P (EK057G)	Potable Water: Major Anions/Cations (NFR-01 and NTRZA)	Potable Water: Ionic Balance (GN025-PG)	Potable Water: PFAS Suggar Ultra Those Long Suite (EP231X-SUT)	Raw Water: pH (EA005P)	Raw Water: EC (EA010P)	Raw Water: TDS - Standard (EA015H)	Raw Water: Suspended Solids - Low Level (EA025H)	Raw Water: Ammonia (EK055G)	Raw Water: Reactive P (EK057G)	Raw Water: Nitrite as N (EK058G)	Raw Water: Major Anions/Cations (NFR-01 and NTRZA)	Raw Water: Ionic Balance (GN025-PG)	Raw Water: Total Hardness (EA065-PG)	Raw Water: PFAS Suggar Ultra Those Long Suite (EP231X-SUT)	TOPA (EP231X+TLL (TOP)) + TOP (EP460)	SOIL: PFAS (EP231X)	HOLD
AA	MW82	9/09/2023	w	1	1	1	1																						
AA	MW83	9/09/2023	w	1	1	1	1																						
AA	MW84	8/09/2023	w	1	1	1	1																						
AA	MW85	8/09/2023	w	1	1	1	1																						
AA	MW89	7/09/2023	w	1	1	1	1																						
AA	MW90	7/09/2023	w	1	1	1	1																						
AA	MW91	8/09/2023	w	1	1	1	1																						
AA	MW94	8/09/2023	w	1	1	1	1																						
AA	MW97	8/09/2023	w	1	1	1	1																						
AA	MW98	8/09/2023	w	1	1	1	1																						
AA	PW2	4/09/2023	w	1	1	1	1																						
AA	RN13030126	7/09/2023	w	1	1	1	1																						
AA	RN13030127	6/09/2023	w	1	1	1	1																						
AA	RN13030692	5/09/2023	w	1	1	1	1																						
AA	RN13030697	6/09/2023	w	1	1	1	1																						
AA	RN13030598	5/09/2023	w	1	1	1	1																						
AA	RN13030715	5/09/2023	w	1	1	1	1																						
AA	SW12	4/09/2023	w	1	1	1	1																						
AA	SW22	4/09/2023	w	1	1	1	1																						
AA	SW45	9/09/2023	w	1	1	1	1																						

Relinquished By:	Received By: FD	Custody Seals Intact	Y N
Dan Papinczak	12/9 1030	Samples Received Chilled	Y N
0439 115 598 10-Sep-23	SIGNATURE DATE	Method of Shipment	

NOTES: Please report with CS Energy EDD format: ENVNC_v4

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Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE QUATERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	3 of 4
Number of Eskies	6

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

Please Split Reports:	SAMPLE ID	DATE	MATRIX	125ml Metals	500ml Nutrients	250-500ml Metals (Dissolved)	60-250ml Plastic (PFAS)	Other GCMS	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Suppor Ultra Trace Long Suite (EP232X-SUT)	Fe (EA065F)	Ca (EA065F)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA037L)	Ammonia (EK055G)	Alkalinity (EA010P)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (Microregulation)	Cold Metals (EM045-W)	Hot Metals (Digested) (EM035)	PFAS Suppor Ultra Trace Long Suite (EP232X-SUT)	TOPA (EP231X-LL (TOP)) + TOS (EP069)	SOIL PFAS (EP232X)	HOLD
				1	1	1	1																						
AA	BD01_0509	5/09/2023	W	1	1	1	1																						
AA	BD02_0709	7/09/2023	W	1	1	1	1																						
AA	BD03_0709	7/09/2023	W	1	1	1	1																						
AA	BD04_0709	7/09/2023	W	1	1	1	1																						
AA	FB01_0509	5/09/2023	W				1																						
AA	FB01_0609	6/09/2023	W				1																						
AA	FB01_0709	7/09/2023	W				1																						
AA	RB01_0509	5/09/2023	W				1																						
AA	RB01_0609	6/09/2023	W				1																						
AA	RB01_0809	8/09/2023	W				1																						

Relinquished By:	Received By	Custody Seals Intact	Y N
Dan Papinczak	SIGNATURE	Samples Received Chille	Y N
0439 115 598 10-Sep-23	DATE	Method of Shipment	

NOTES: Please report with CS Energy EDD format ENVM_V4

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CERTIFICATE OF ANALYSIS

Work Order	: **EB2330490**	Page	: 1 of 5
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02 Callide Quarterly Monitoring	Date Samples Received	: 03-Oct-2023 07:46
Order number	: ----	Date Analysis Commenced	: 04-Oct-2023
C-O-C number	: ----	Issue Date	: 09-Oct-2023 17:25
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V4		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X-LL(TOP) PFAS TOPA: Sample "MW84"(EB2330490-001) required dilution prior to extraction due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP040: Total Organic Fluorine (TOF) in waters and leachates represents the total fluorine in the organic forms which can be extracted by the SPE method.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW84	----	----	----	----
				Sampling date / time	08-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2330490-001	--------	--------	--------	--------
					Result	----	----	----	----
EP040: Total Organic Fluorine (TOF)									
Total Organic Fluorine	----	20	µg/L		**30**	----	----	----	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		**2.53**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		**2.37**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		**17.5**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		**0.812**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		**8.69**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.019	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		**1.25**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		**1.83**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		**6.92**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		**0.597**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		**1.14**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.019	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.019	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.019	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.019	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.019	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.048	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.019	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.048	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW84	----	----	----	----
				Sampling date / time	08-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2330490-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.048	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.048	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.048	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.019	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.019	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.019	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.019	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.019	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.019	----	----	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		**43.6**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		**26.2**	----	----	----	----
^ **Sum of TOP C4 - C14 as Fluorine**	----	0.002	µg/L		**27.5**	----	----	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		**43.6**	----	----	----	----
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**90.0**	----	----	----	----
13C8-PFOA	----	0.002	%		**107**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	34	137
13C8-PFOA	----	56	129

QUALITY CONTROL REPORT

Work Order	: **EB2330490**	Page	: 1 of 4
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02 Callide Quarterly Monitoring	Date Samples Received	: 03-Oct-2023
Order number	: ----	Date Analysis Commenced	: 04-Oct-2023
C-O-C number	: ----	Issue Date	: 09-Oct-2023
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V4		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP040: Total Organic Fluorine (TOF) (QC Lot: 5341035)									
EB2330490-001	MW84	EP040: Total Organic Fluorine	----	20	µg/L	30	30	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP040: Total Organic Fluorine (TOF) (QCLot: 5341035)								
EP040: Total Organic Fluorine	----	20	µg/L	<20	477 µg/L	89.7	70.0	120
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5336665)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.475 µg/L	81.4	44.9	136
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.465 µg/L	85.0	33.2	116
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5336665)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	----	----	----	----
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.5 µg/L	110	47.0	123
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5336665)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5336665) - continued								
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5336665)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.0476 µg/L	-0.2	0	200
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_P: PFAS Sums (QCLot: 5336665)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP040: Total Organic Fluorine (TOF) (QCLot: 5341035)							
EB2330758-003	Anonymous	EP040: Total Organic Fluorine	----	477 µg/L	89.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2330490**	Page	: 1 of 5
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BC200153.02 Callide Quarterly Monitoring	Date Samples Received	: 03-Oct-2023
Site	: ----	Issue Date	: 09-Oct-2023
Sampler	: DANIEL PAPINCZAK	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP040: Total Organic Fluorine (TOF)						
HDPE (no PTFE)						
MW84	----	----	----	08-Oct-2023	06-Oct-2023	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PFAS by LCMSMS after SPE and oxidation (TOP)	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP040: Total Organic Fluorine (TOF)							
HDPE (no PTFE) (EP040)							
MW84	**08-Sep-2023**	**06-Oct-2023**	06-Oct-2023	✓	**08-Oct-2023**	06-Oct-2023	×
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW84	**08-Sep-2023**	**04-Oct-2023**	06-Mar-2024	✓	**06-Oct-2023**	06-Mar-2024	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW84	**08-Sep-2023**	**04-Oct-2023**	06-Mar-2024	✓	**06-Oct-2023**	06-Mar-2024	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW84	**08-Sep-2023**	**04-Oct-2023**	06-Mar-2024	✓	**06-Oct-2023**	06-Mar-2024	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW84	**08-Sep-2023**	**04-Oct-2023**	06-Mar-2024	✓	**06-Oct-2023**	06-Mar-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_P: PFAS Sums							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW84	**08-Sep-2023**	**04-Oct-2023**	06-Mar-2024	✓	**06-Oct-2023**	06-Mar-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Organic Fluorine (TOF)	EP040	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Total Organic Fluorine (TOF)	EP040	WATER	In house: Fluorinated organic compounds are isolated from the sample by adsorption onto activated carbon. Hydropyrolytic combustion of the SPE extract converts organic forms of fluorine to hydrogen fluoride (HF). The HF is adsorbed in a trapping solution and the total fluoride concentration determined by Ion Chromatography (IC).
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349. Sample extracts are analysed by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.

Preparation Methods	Method	Matrix	Method Descriptions
Total Organic Fluorine Preparation - Waters	EP040-PR	WATER	In house - Fluorinated organic compounds are isolated by Solid Phase Extraction (SPE). Inorganic fluorine is displaced by washing with water and organic forms eluted with Methanol.
Total Oxidisable Precuror Digest for PFAS - Low Level	* ORG70-SPE	WATER	In-House SPE followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349: A 50 mL sample is concentrated by SPE, taken to near dryness and made up to 5 mL in a reagent solution. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2330490**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BC200153.02 Callide Quarterly Monitoring	Page	: 1 of 4
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V4)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DANIEL PAPINCZAK		

Dates

Date Samples Received	: 03-Oct-2023 07:46	Issue Date	: 03-Oct-2023
Client Requested Due Date	: 10-Oct-2023	Scheduled Reporting Date	: **10-Oct-2023**

Delivery Details

Mode of Delivery	: Samples On Hand	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: ----
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please be advised ALS does not offer Low Level Total Organic Flouorine as there is no difference in LOR. If you wish to discuss this further, please contact Client Services at ALSEnviro.Brisbane@alsglobal.com.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- This is a rebatch of EB2328001.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP040 Total Organic Fluorine (TOF)	WATER - EP231X-LL (TOP) PFAS - Total Oxidisable Precursor (TOP) Assay -
EB2330490-001	08-Sep-2023 00:00	MW84	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

CS ENERGY ENVIRONMENTAL DATA

- *AU Certificate of Analysis - NATA (COA)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	CSEnergyEnvironmentData@csenergy.com.au
- Chain of Custody (CoC) (COC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ESDAT (ESDAT)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - XTab (XTAB)	Email	CSEnergyEnvironmentData@csenergy.com.au

DANIEL PAPINCZAK

- *AU Certificate of Analysis - NATA (COA)	Email	dpapinczak@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	dpapinczak@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	dpapinczak@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	dpapinczak@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	dpapinczak@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	dpapinczak@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	dpapinczak@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	dpapinczak@epicenvironmental.com.au

ESDAT REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au
- EDI Format - XTab (XTAB)	Email	epicenvironmental@esdat.com.au

INVOICES

- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au

LUKE AMIES

- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

From: Luke Amies <lamies@epicenvironmental.com.au>
Sent: Sunday, 1 October 2023 5:52 AM
To: Nathan King <Nathan.King@alsglobal.com>; ALSEnviro Brisbane <ALSEnviro.Brisbane@alsglobal.com>
Subject: [EXTERNAL] - RE: RESULTS & EDD for ALS Workorder : EB2328001 | Your Reference: BC200153.02 Callide Quarterly Monitoring

CAUTION: This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hi Nathan,

If you still have these samples, could I request sample MW84 (EB2328001-023) be run for TOPA and TOF at low level.

Thanks,

Environmental Division
Brisbane
Work Order Reference
EB2330490

Telephone : + 61-7-3243 7222

Luke Amies
0447 661 021

-------- Original message --------
From: angel-no-reply@alsglobal.com
Date: 21/9/23 7:22 pm (GMT+10:00)
To: Luke Amies <lamies@epicenvironmental.com.au>
Subject: RESULTS & EDD for ALS Workorder : EB2328001 | Your Reference: BC200153.02 Callide Quarterly Monitoring

Deliverables for ALS Workorder EB2328001

Project: BC200153.02 Callide Quarterly Monitoring

Dear LUKE AMIES,

Please find enclosed the following deliverables for **EB2328001**:

- BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Chemistry2e.CSV
- BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Header.XML
- BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Sample2e.CSV
- EB2328001_0_COA.pdf
- EB2328001_0_XTAB.XLS
- EB2328001_0_QC.pdf

- EB2328001_0_QCI.pdf
- EB2328001_0_BC200153 02 Callide Quarterly Monitoring_ENVNC_V4.csv
- EB2328001_COC.pdf

Report Recipients

- LUKE AMIES
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Chemistry2e.CSV
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Header.XML
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Sample2e.CSV
  - EB2328001_0_COA.pdf (Email)
  - EB2328001_0_XTAB.XLS
  - EB2328001_0_QC.pdf (Email)
  - EB2328001_0_QCI.pdf (Email)
  - EB2328001_0_BC200153 02 Callide Quarterly Monitoring_ENVNC_V4.csv
  - EB2328001_COC.pdf (Email)
- INVOICES
  - EB2328001_COC.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
- DANIEL PAPINCZAK
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Chemistry2e.CSV
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Header.XML
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Sample2e.CSV
  - EB2328001_0_COA.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_XTAB.XLS
  - EB2328001_0_QC.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_QCI.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_BC200153 02 Callide Quarterly Monitoring_ENVNC_V4.csv
  - EB2328001_COC.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
- MICHAEL KOWALCZYK
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Chemistry2e.CSV
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Header.XML
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Sample2e.CSV
  - EB2328001_0_COA.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_XTAB.XLS
  - EB2328001_0_QC.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_QCI.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_BC200153 02 Callide Quarterly Monitoring_ENVNC_V4.csv
  - EB2328001_COC.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
- EPIC
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Chemistry2e.CSV
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Header.XML
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Sample2e.CSV
  - EB2328001_0_COA.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_XTAB.XLS
  - EB2328001_0_QC.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_QCI.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_BC200153 02 Callide Quarterly Monitoring_ENVNC_V4.csv
  - EB2328001_COC.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
- CS ENERGY ENVIRONMENTAL DATA
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Chemistry2e.CSV
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Header.XML
  - BC200153 02 Callide Quarterly Monitoring.ESDAT_EB2328001_0.Sample2e.CSV
  - EB2328001_0_COA.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_XTAB.XLS
  - EB2328001_0_QC.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_QCI.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)
  - EB2328001_0_BC200153 02 Callide Quarterly Monitoring_ENVNC_V4.csv
  - EB2328001_COC.pdf (Email, Email, Email, Email, Email, Email, Email, Email, Email)

1026209

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE QUATERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	4 of 4
Number of Eskies:	6

Lab:	Please send to Eurofins
Lab Quote No:	
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

Please Split Reports:	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS
AA	SD01_0509	5/09/2023	w	1	1	1	1	
AA	SD02_0709	7/09/2023	w	1	1	1	1	
AA	SD03_0709	7/09/2023	w	1	1	1	1	
AA	SD04_0709	7/09/2023	w	1	1	1	1	

Potable Water							Bore Water												SOIL	
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Suppr Ultra Trace Long Suite (EP231X-SUT)	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Suppr Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TDFP)) + TOF (EP040)	PFAS (EP231X)	HOLD
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			
							x	x	x	x	x	x	x	x	x	x	x			

Relinquished By:	Received By	Custody Seals Intact Y N
Dan Papinczak	SIGNATURE	Samples Received Chille Y N
0439 115 598 10-Sep-23	DATE 12/9 1030	Method of Shipment

NOTES: Please report with CS Energy EDD format; ENVNC, V4

Epic Environmental Pty Ltd ABN 54 169 579 275

Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email mkowalczyk@epicenv
email lamies@epicenvironm
email epicenvironmental@e
email labs@epicenvironmen
email CSEnergyEnvironment

Date/Time: 13/9/23 1:05pm

Chilled: ✓

Temp:

Correction: -3.2

Final Temp:

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

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Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Site# 2370

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Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Dan Papinczak
Project name:	CALLIDE QUATERLY MONITORING
Project ID:	BC200153.03
Turnaround time:	5 Day
Date/Time received	Sep 13, 2023 1:05 PM
Eurofins reference	1026209

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Dan Papinczak - dpapinczak@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

Global Leader - Results you can trust

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
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VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

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Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Order No.:
Report #: 1026209
Phone: 0400 497 512
Fax:

Received: Sep 13, 2023 1:05 PM
Due: Sep 20, 2023
Priority: 5 Day
Contact Name: Dan Papinczak

Project Name: CALLIDE QUATERLY MONITORING
Project ID: BC200153.03

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Iron	Manganese	Nitrate (as N)	Nitrite (as N)	pH (at 25 °C)	Phosphorus reactive (as P)	Total Suspended Solids Dried at 103 °C to 105 °C (low level)	Ion Balance Set	Eurofins Suite B11E: Cl/SO4/Alkalinity	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254													X		X				
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X	X	X	X	X		X		X	X	X	X
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	SD01_0509	Sep 05, 2023		Water	B23-Se0033665	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SD02_0709	Sep 07, 2023		Water	B23-Se0033666	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SD03_0709	Sep 07, 2023		Water	B23-Se0033667	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SD04_0709	Sep 07, 2023		Water	B23-Se0033668	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						4	4	4	4	4	4	4	4	4	4	4	4	4	4

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Luke Amies**

Report **1026209-W**
Project name CALLIDE QUATERLY MONITORING
Project ID BC200153.03
Received Date Sep 13, 2023

Client Sample ID			**SD01_0509**	**SD02_0709**	**SD03_0709**	**SD04_0709**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**B23-Se0033665**	**B23-Se0033666**	**B23-Se0033667**	**B23-Se0033668**
Date Sampled			**Sep 05, 2023**	**Sep 07, 2023**	**Sep 07, 2023**	**Sep 07, 2023**
Test/Reference	LOR	Unit				
Ammonia (as N)	0.01	mg/L	< 0.01	0.38	0.39	0.38
Chloride	1	mg/L	140	1900	100	120
Conductivity (at 25 °C)	10	uS/cm	890	7000	710	710
Nitrate (as N)	0.02	mg/L	0.27	< 0.02	0.30	0.32
Nitrite (as N)	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
pH (at 25 °C)	0.1	pH Units	7.3	7.1	7.2	7.3
Phosphorus reactive (as P)	0.01	mg/L	0.02	< 0.01	0.03	0.02
Sulphate (as SO4)	5	mg/L	48	4600	3400	3700
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	530	5000	120	390
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	< 5	38	< 5	< 5
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	180	510	150	140
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	180	510	150	140
Ion Balance Set						
Ionic Balance*	0.01	%	-1.9	-32.8	-85.3	-86.3
Total Anions*	0.01	meq/L	8.5	159.5	76.5	83.1
Total Cations*	0.01	meq/L	8.2	80.6	6.1	6.1
Heavy Metals						
Iron	0.05	mg/L	< 0.05	0.07	< 0.05	< 0.05
Manganese	0.005	mg/L	0.025	0.65	< 0.005	< 0.005
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	57	520	42	40
Magnesium	0.5	mg/L	28	500	19	18
Potassium	0.5	mg/L	4.8	0.9	1.6	1.3
Sodium	0.5	mg/L	68	310	55	60
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace						
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	< 0.005	0.19	< 0.005	< 0.005
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	< 0.001	0.11	< 0.001	< 0.001
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	< 0.001	0.95	< 0.001	< 0.001
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SD01_0509	SD02_0709	SD03_0709	SD04_0709
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			B23-Se0033665	B23-Se0033666	B23-Se0033667	B23-Se0033668
Date Sampled			Sep 05, 2023	Sep 07, 2023	Sep 07, 2023	Sep 07, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace						
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	< 0.001	0.16	< 0.001	< 0.001
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	< 0.001	0.29	< 0.001	< 0.001
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C4-PFBA (surr.)	1	%	97	62	102	83
13C5-PFPeA (surr.)	1	%	110	65	109	120
13C5-PFHxA (surr.)	1	%	150	121	114	140
13C4-PFHpA (surr.)	1	%	147	125	127	150
13C8-PFOA (surr.)	1	%	63	76	124	126
13C5-PFNA (surr.)	1	%	91	91	129	122
13C6-PFDA (surr.)	1	%	84	67	114	115
13C2-PFUnDA (surr.)	1	%	79	84	103	99
13C2-PFDoDA (surr.)	1	%	103	103	123	116
13C2-PFTeDA (surr.)	1	%	77	72	84	91
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	< 0.001	0.49	< 0.001	< 0.001
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	< 0.001	0.17	< 0.001	< 0.001
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	< 0.001	0.71	< 0.001	< 0.001
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	0.002	< 0.001	0.010	0.009
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	< 0.001	0.16	< 0.001	< 0.001
Perfluorooctanesulfonic acid (PFOS)[N11]	0.0001	ug/L	0.0034	0.82	0.0092	0.054
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C3-PFBS (surr.)	1	%	51	68	89	105
18O2-PFHxS (surr.)	1	%	87	77	120	130
13C8-PFOS (surr.)	1	%	94	70	112	92
Perfluoroalkyl sulfonamido substances- Ultra Trace						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
13C8-FOSA (surr.)	1	%	87	90	108	89
D3-N-MeFOSA (surr.)	1	%	49	42	67	59
D5-N-EtFOSA (surr.)	1	%	48	36	55	58
D7-N-MeFOSE (surr.)	1	%	51	37	52	49
D9-N-EtFOSE (surr.)	1	%	53	44	58	57
D5-N-EtFOSAA (surr.)	1	%	85	194	51	79
D3-N-MeFOSAA (surr.)	1	%	97	83	65	110

Client Sample ID			SD01_0509	SD02_0709	SD03_0709	SD04_0709
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			B23-Se0033665	B23-Se0033666	B23-Se0033667	B23-Se0033668
Date Sampled			Sep 05, 2023	Sep 07, 2023	Sep 07, 2023	Sep 07, 2023
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	< 0.005	0.007	< 0.005	< 0.005
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C2-4:2 FTSA (surr.)	1	%	41	145	88	91
13C2-6:2 FTSA (surr.)	1	%	105	66	98	125
13C2-8:2 FTSA (surr.)	1	%	97	118	62	82
13C2-10:2 FTSA (surr.)	1	%	77	143	72	83
PFASs Summations						
Sum (PFHxS + PFOS)*	0.001	ug/L	0.0054	0.82	0.0192	0.063
Sum of US EPA PFAS (PFOS + PFOA)*	0.001	ug/L	0.0034	0.98	0.0092	0.054
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	ug/L	0.0054	0.98	0.0192	0.063
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	0.0054	3.017	0.0192	0.063
Sum of PFASs (n=30)*	0.005	ug/L	0.0054	4.057	0.0192	0.063

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Ammonia (as N)	Brisbane	Sep 18, 2023	28 Days
- Method: LTM-INO-4200 Ammonia by Discrete Analyser			
Conductivity (at 25 °C)	Brisbane	Sep 19, 2023	28 Days
- Method: APHA 2510B			
Nitrate (as N)	Brisbane	Sep 18, 2023	28 Day
- Method: LTM-INO-4350 Determination of NO2, NO3, NOx in Water by Discrete Analyser			
Nitrite (as N)	Brisbane	Sep 18, 2023	2 Days
- Method: LTM-INO-4350 Determination of NO2, NO3, NOx in Water by Discrete Analyser			
pH (at 25 °C)	Brisbane	Sep 19, 2023	0 Days
- Method: LTM-GEN-7090 pH in water by ISE			
Phosphorus reactive (as P)	Melbourne	Sep 18, 2023	2 Days
- Method: APHA 4500-P			
Total Suspended Solids Dried at 103 °C to 105 °C	Brisbane	Sep 25, 2023	7 Days
- Method: APHA 2540 D			
Ion Balance Set	Melbourne	Sep 14, 2023	
- Method: APHA 1030E (1)			
Heavy Metals	Brisbane	Sep 18, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Brisbane	Sep 18, 2023	180 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11E: Cl/SO4/Alkalinity			
Chloride	Brisbane	Sep 18, 2023	28 Day
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Sulphate (as SO4)	Brisbane	Sep 18, 2023	28 Day
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Alkalinity (speciated)	Brisbane	Sep 18, 2023	14 Day
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Brisbane	Sep 18, 2023	7 Days
- Method: APHA 2540 C			
Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace			
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace	Brisbane	Sep 18, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace	Brisbane	Sep 18, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonamido substances- Ultra Trace	Brisbane	Sep 18, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) Ultra trace			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace	Brisbane	Sep 18, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
PFASs Summations	Brisbane	Sep 18, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
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Project Name: CALLIDE QUATERLY MONITORING
Project ID: BC200153.03

Order No.:
Report #: 1026209
Phone: 0400 497 512
Fax:

Received: Sep 13, 2023 1:05 PM
Due: Sep 20, 2023
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Iron	Manganese	Nitrate (as N)	Nitrite (as N)	pH (at 25 °C)	Phosphorus reactive (as P)	Total Suspended Solids Dried at 103 °C to 105 °C (low level)	Ion Balance Set	Eurofins Suite B11E: Cl/SO4/Alkalinity	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254													X		X				X
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X	X	X	X	X		X		X	X	X	X
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	SD01_0509	Sep 05, 2023		Water	B23-Se0033665	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SD02_0709	Sep 07, 2023		Water	B23-Se0033666	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SD03_0709	Sep 07, 2023		Water	B23-Se0033667	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SD04_0709	Sep 07, 2023		Water	B23-Se0033668	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						4	4	4	4	4	4	4	4	4	4	4	4	4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Phosphorus reactive (as P)	mg/L	< 0.01			0.01	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	mg/L	< 5			5	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Carbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Hydroxide Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Heavy Metals							
Iron	mg/L	< 0.05			0.05	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.005			0.005	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.001			0.001	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.001			0.001	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.001			0.001	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.001			0.001	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.001			0.001	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.001			0.001	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.001			0.001	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.0001			0.0001	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances- Ultra Trace							
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.005			0.005	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.005			0.005	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.005			0.005	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.005			0.005	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.005			0.005	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.005			0.005	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Chloride	%	108			70-130	Pass	
Phosphorus reactive (as P)	%	99			70-130	Pass	
Sulphate (as SO4)	%	99			70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	%	85			70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	%	95			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	%	116			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Iron	%	94			80-120	Pass	
Manganese	%	97			80-120	Pass	
LCS - % Recovery							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	%	110			80-120	Pass	
Magnesium	%	106			80-120	Pass	
Potassium	%	100			80-120	Pass	
Sodium	%	111			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	%	76			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	80			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	75			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	88			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	95			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	91			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	93			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	83			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	77			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	79			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	97			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	%	69			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	88			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	68			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	72			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	77			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	84			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	106			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	77			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances- Ultra Trace							
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	67			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	61			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	79			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)			%	70			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)			%	84			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)			%	72			50-150	Pass	
Perfluorooctane sulfonamide (FOSA)			%	82			50-150	Pass	
LCS - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)			%	92			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)			%	85			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)			%	82			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)			%	71			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
				Result 1					
Ammonia (as N)	B23-Se0029719	NCP	%	121			70-130	Pass	
Chloride	B23-Se0035696	NCP	%	98			70-130	Pass	
Sulphate (as SO4)	B23-Se0035696	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Iron	B23-Se0032216	NCP	%	91			75-125	Pass	
Manganese	B23-Se0032216	NCP	%	93			75-125	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	B23-Se0032216	NCP	%	95			75-125	Pass	
Magnesium	B23-Se0032216	NCP	%	96			75-125	Pass	
Potassium	B23-Se0032190	NCP	%	95			75-125	Pass	
Sodium	B23-Se0032489	NCP	%	104			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	B23-Se0029719	NCP	mg/L	0.70	0.70	<1	30%	Pass	
Chloride	B23-Se0033680	NCP	mg/L	650	640	1.7	30%	Pass	
Conductivity (at 25 °C)	B23-Se0033665	CP	uS/cm	890	910	2.3	30%	Pass	
pH (at 25 °C)	B23-Se0033665	CP	pH Units	7.3	7.3	<1	30%	Pass	
Sulphate (as SO4)	B23-Se0033680	NCP	mg/L	17	17	<1	30%	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	B23-Se0029726	NCP	mg/L	12	14	15	30%	Pass	
Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Bicarbonate Alkalinity (as CaCO3)	B23-Se0033665	CP	mg/L	180	180	<1	30%	Pass	
Carbonate Alkalinity (as CaCO3)	B23-Se0033665	CP	mg/L	< 20	< 20	<1	30%	Pass	
Hydroxide Alkalinity (as CaCO3)	B23-Se0033665	CP	mg/L	< 20	< 20	<1	30%	Pass	
Total Alkalinity (as CaCO3)	B23-Se0033665	CP	mg/L	180	180	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Iron	B23-Se0032215	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Manganese	B23-Se0032215	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	B23-Se0032215	NCP	mg/L	7.8	7.6	3.0	30%	Pass	
Magnesium	B23-Se0032215	NCP	mg/L	6.5	6.0	8.9	30%	Pass	
Potassium	B23-Se0032215	NCP	mg/L	69	63	9.0	30%	Pass	
Sodium	B23-Se0032215	NCP	mg/L	48	44	8.2	30%	Pass	

Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Se0035260	NCP	ug/L	0.33	0.31	7.6	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Se0035260	NCP	ug/L	0.37	0.34	7.2	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Se0035260	NCP	ug/L	1.4	1.5	6.0	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Se0035260	NCP	ug/L	0.002	0.001	4.2	30%	Pass	
Perfluorooctanoic acid (PFOA)	B23-Se0035260	NCP	ug/L	0.10	0.11	4.2	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Se0035260	NCP	ug/L	0.67	0.64	5.2	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Se0035260	NCP	ug/L	0.80	0.69	15	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Se0035260	NCP	ug/L	0.31	0.25	21	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Se0035260	NCP	ug/L	1.2	0.91	25	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Se0035260	NCP	ug/L	0.009	0.010	2.0	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Se0035260	NCP	ug/L	0.10	0.10	8.9	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1	Result 2	RPD			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Se0035260	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Se0035260	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Se0035260	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Se0035260	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Se0035260	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Se0035260	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
Perfluorooctane sulfonamide (FOSA)	B23-Se0035260	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Se0035260	NCP	ug/L	0.009	0.009	3.2	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Se0035260	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids Dried at 180 °C ± 2 °C	B23-Se0033666	CP	mg/L	5000	4900	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Jonathon Angell	Senior Analyst-Inorganic
Jonathon Angell	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-PFAS
Mary Makarios	Senior Analyst-Inorganic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2339725**	Page	: 1 of 13
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 19-Dec-2023 11:30
Order number	: ----	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: ----	Issue Date	: 05-Jan-2024 15:33
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V4		
No. of samples received	: 12		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Soil Preparation, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- ED040T (Total Major Anions by ICP-AES): EB2339725-001 shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- ED093S (Soluble Major Cations by ICP): EDC-SED-1 (EB2339725-001) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EP231X-PFAS: Sample (EB2339711-002) shows poor matrix spike results due to heterogeneity. Confirmed by visual inspection.
- EP231X-SUT-PFAS: High LCS recovery deemed acceptable as all associated analyte results are less than LOR
- EP231X-SUT-PFAS: Particular samples showed matrix interference indicated by internal standard recovery lower than 50%. This is deemed acceptable as all associated analytes are less than the limit of reporting.
- EP231X-SUT- PFAS: The LOR for PFNA and PFBA have been raised in particular samples due to matrix interference.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	EDC-SED-1	EDC-SED-2	EDC-SED-3	EDC-SED-4	EDC-SED-5
			Sampling date / time	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339725-001	EB2339725-002	EB2339725-003	EB2339725-004	EB2339725-005
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**7.8**	**7.9**	**7.8**	**8.7**	**8.7**
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	**2840**	**6250**	**4290**	**136**	**90**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**50.3**	**25.3**	**38.1**	**4.6**	**5.7**
ED040: Sulfur as SO4 2-								
Sulfate as SO4 2-	14808-79-8	100	mg/kg	**22200**	**12500**	**10700**	**290**	**170**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	**6700**	**8830**	**6520**	**20**	<10
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	**1570**	**3680**	**3790**	**80**	**50**
Magnesium	7439-95-4	10	mg/kg	**1140**	**1920**	**1550**	**40**	**30**
Sodium	7440-23-5	10	mg/kg	**2820**	**4140**	**3020**	**10**	**20**
Potassium	7440-09-7	10	mg/kg	**110**	**140**	**120**	**10**	**10**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0006**	**0.0003**	**0.0004**	**0.0002**	**0.0003**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0081**	**0.0035**	**0.0026**	**0.0036**	**0.0079**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	EDC-SED-1	EDC-SED-2	EDC-SED-3	EDC-SED-4	EDC-SED-5
			Sampling date / time	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339725-001	EB2339725-002	EB2339725-003	EB2339725-004	EB2339725-005
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0002**	**0.0002**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	EDC-SED-1	EDC-SED-2	EDC-SED-3	EDC-SED-4	EDC-SED-5
				Sampling date / time	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339725-001	EB2339725-002	EB2339725-003	EB2339725-004	EB2339725-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0089**	**0.0038**	**0.0030**	**0.0040**	**0.0084**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0087**	**0.0038**	**0.0030**	**0.0038**	**0.0082**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0087**	**0.0038**	**0.0030**	**0.0040**	**0.0084**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.5**	**89.5**	**96.5**	**89.0**	**95.0**
13C8-PFOA	----	0.0002	%		**97.0**	**96.0**	**102**	**91.0**	**88.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	EDC-SED-6	EDC-SED-7	SED-QC01_1112	----	----
			Sampling date / time	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2339725-006	EB2339725-007	EB2339725-008	--------	--------
				Result	Result	Result	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**7.7**	**8.4**	**7.7**	**----**	**----**
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	**4660**	**113**	**7470**	**----**	**----**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**29.4**	**10.6**	**40.2**	**----**	**----**
ED040: Sulfur as SO4 2-								
Sulfate as SO4 2-	14808-79-8	100	mg/kg	**9270**	**140**	**6580**	**----**	**----**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	10	mg/kg	**9660**	**30**	**20100**	**----**	**----**
ED093S: Soluble Major Cations								
Calcium	7440-70-2	10	mg/kg	**3970**	**110**	**4380**	**----**	**----**
Magnesium	7439-95-4	10	mg/kg	**2780**	**20**	**4530**	**----**	**----**
Sodium	7440-23-5	10	mg/kg	**1770**	**10**	**3150**	**----**	**----**
Potassium	7440-09-7	10	mg/kg	**50**	<10	**40**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	**0.0059**	<0.0002	**0.0173**	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	**0.0078**	<0.0002	**0.0216**	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0647**	<0.0002	**0.113**	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	**0.0051**	<0.0002	**0.0078**	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.230**	<0.0002	**0.244**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	**0.001**	<0.001	**0.004**	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	**0.0016**	<0.0002	**0.0052**	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0097**	<0.0002	**0.0279**	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	EDC-SED-6	EDC-SED-7	SED-QC01_1112	----	----
				Sampling date / time	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2339725-006	EB2339725-007	EB2339725-008	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0013**	<0.0002	**0.0031**	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0029**	<0.0002	**0.0056**	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	EDC-SED-6	EDC-SED-7	SED-QC01_1112	----	----
				Sampling date / time	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2339725-006	EB2339725-007	EB2339725-008	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.330**	<0.0002	**0.450**	**----**	**----**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.295**	<0.0002	**0.357**	**----**	**----**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.317**	<0.0002	**0.420**	**----**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**103**	**94.0**	**95.5**	**----**	**----**
13C8-PFOA	----	0.0002	%		**92.0**	**90.5**	**96.0**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	ADB PW3	ADB PW4	ADB PW5	ADB PW6	----
			Sampling date / time	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	----
Compound	CAS Number	LOR	Unit	EB2339725-009	EB2339725-010	EB2339725-011	EB2339725-012	--------
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.16**	**7.75**	**7.81**	**7.78**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**11400**	**10900**	**10800**	**10700**	**----**
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**9480**	**9240**	**9300**	**9340**	**----**
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	**13**	**14**	**18**	**13**	**----**
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	**----**
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	**----**
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**98**	**95**	**95**	**94**	**----**
Total Alkalinity as CaCO3	----	1	mg/L	**98**	**95**	**95**	**94**	**----**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2390**	**2320**	**2660**	**3560**	**----**
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**2870**	**2910**	**2940**	**2840**	**----**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**620**	**609**	**612**	**574**	**----**
Magnesium	7439-95-4	1	mg/L	**429**	**423**	**419**	**408**	**----**
Sodium	7440-23-5	1	mg/L	**1310**	**1270**	**1270**	**1210**	**----**
Potassium	7440-09-7	1	mg/L	**29**	**28**	**29**	**27**	**----**
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	**0.279**	**0.281**	**0.343**	**0.289**	**----**
Iron	7439-89-6	0.05	mg/L	**0.27**	**0.34**	**0.66**	**0.35**	**----**
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**1.3**	**1.3**	**1.3**	**1.4**	**----**
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	ADB PW3	ADB PW4	ADB PW5	ADB PW6	----
			Sampling date / time	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	----
Compound	CAS Number	LOR	Unit	EB2339725-009	EB2339725-010	EB2339725-011	EB2339725-012	--------
				Result	Result	Result	Result	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.01**	<0.01	<0.01	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.01**	<0.01	<0.01	<0.01	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**133**	**132**	**140**	**156**	----
ø Total Cations	----	0.01	meq/L	**124**	**121**	**121**	**116**	----
ø Ionic Balance	----	0.01	%	**3.39**	**4.39**	**7.35**	**14.9**	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	**0.0121**	**0.0128**	**0.0146**	**0.0149**	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	**0.0088**	**0.0092**	**0.0099**	**0.0100**	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	**0.0457**	**0.0512**	**0.0555**	**0.0596**	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	**0.0012**	**0.0012**	**0.0011**	**0.0012**	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.0222**	**0.0179**	**0.0204**	**0.0188**	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	<0.0005	<0.0005	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.0340	<0.0440	<0.0500	<0.0580	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	**0.0069**	**0.0059**	**0.0062**	**0.0076**	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	**0.0049**	**0.0053**	**0.0060**	**0.0059**	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	**0.0045**	**0.0067**	**0.0082**	**0.0094**	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	**0.0022**	**0.0022**	**0.0024**	**0.0025**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	ADB PW3	ADB PW4	ADB PW5	ADB PW6	----
				Sampling date / time	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	----
Compound	CAS Number	LOR	Unit		EB2339725-009	EB2339725-010	EB2339725-011	EB2339725-012	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		**0.0010**	<0.0010	**0.0009**	**0.0010**	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	ADB PW3	ADB PW4	ADB PW5	ADB PW6	----
				Sampling date / time	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	11-Dec-2023 00:00	----
Compound	CAS Number	LOR	Unit		EB2339725-009	EB2339725-010	EB2339725-011	EB2339725-012	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.0679**	**0.0691**	**0.0759**	**0.0784**	----
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.0985**	**0.102**	**0.113**	**0.119**	----
^ **Sum of PFAS**	----	0.0002	µg/L		**0.110**	**0.112**	**0.125**	**0.131**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**120**	**99.8**	**93.3**	**86.4**	----
13C8-PFOA	----	0.0005	%		**113**	**106**	**107**	**103**	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2339725**	Page	: 1 of 12
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 19-Dec-2023
Order number	: ----	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: ----	Issue Date	: 05-Jan-2024
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V4		
No. of samples received	: 12		
No. of samples analysed	: 12		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Soil Preparation, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA002: pH 1:5 (Soils) (QC Lot: 5505464)									
EB2339725-001	EDC-SED-1	EA002: pH Value	----	0.1	pH Unit	7.8	7.7	0.0	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 5505463)									
EB2339725-001	EDC-SED-1	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	2840	3400	17.8	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5505471)									
EB2339711-001	Anonymous	EA055: Moisture Content	----	0.1	%	5.0	5.1	2.3	0% - 20%
EB2339725-005	EDC-SED-5	EA055: Moisture Content	----	0.1 (1.0)*	%	5.7	5.8	2.0	No Limit
ED040T : Total Sulfate by ICPAES (QC Lot: 5505470)									
EB2339725-001	EDC-SED-1	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	22200	# 13700	47.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5505466)									
EB2339725-001	EDC-SED-1	ED045G: Chloride	16887-00-6	10	mg/kg	6700	7560	12.1	0% - 20%
ED093S: Soluble Major Cations (QC Lot: 5505465)									
EB2339725-001	EDC-SED-1	ED093S: Calcium	7440-70-2	10	mg/kg	1570	# 2410	42.4	0% - 20%
		ED093S: Magnesium	7439-95-4	10	mg/kg	1140	# 1490	26.8	0% - 20%
		ED093S: Sodium	7440-23-5	10	mg/kg	2820	3370	17.6	0% - 20%
		ED093S: Potassium	7440-09-7	10	mg/kg	110	130	20.4	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5505462)									
EB2339711-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5505462) - continued									
EB2339711-001	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0016	0.0013	17.8	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2339725-005	EDC-SED-5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0079	0.0067	17.2	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5505462)									
EB2339711-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2339725-005	EDC-SED-5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5505462)									
EB2339711-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5505462) - continued									
EB2339711-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2339725-005	EDC-SED-5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5505462)									
EB2339711-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2339725-005	EDC-SED-5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 5511634)									
EB2340308-007	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.67	7.71	0.5	0% - 20%
EB2339725-009	ADB PW3	EA005-P: pH Value	----	0.01	pH Unit	7.16	7.21	0.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5511631)									
EB2340308-007	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	904	891	1.4	0% - 20%
EB2339725-009	ADB PW3	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	11400	11500	0.9	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5504035)									
EB2339715-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	903	909	0.7	0% - 20%
EB2339753-005	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	10800	10500	3.6	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5504036)									
EB2339715-001	Anonymous	EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit
EB2339753-005	Anonymous	EA025LL: Suspended Solids (SS)	----	1	mg/L	37	35	6.9	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5511633)									
EB2340308-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	360	357	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	360	357	0.9	0% - 20%
EB2339725-009	ADB PW3	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	98	97	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	98	97	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5513901)									
EB2339753-026	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	688	693	0.6	0% - 20%
EB2339753-048	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	49	49	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5513899)									
EB2339753-026	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3240	3270	1.1	0% - 20%
EB2339753-048	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	730	727	0.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5515399)									
EB2340341-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	7	7	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	6	7	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	78	83	5.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
EB2338992-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	3	3	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	1310	1270	3.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	8	8	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5507445)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 5507445) - continued									
EB2340008-101	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2339753-037	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	2.10	2.01	4.3	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.59	0.56	6.7	0% - 50%
EK040P: Fluoride by PC Titrator (QC Lot: 5511632)									
EB2339725-009	ADB PW3	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.3	1.3	0.0	0% - 50%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5514333)									
EB2340121-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.04	53.3	No Limit
EB2339715-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01 (0.05)*	mg/L	<0.05	<0.05	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5513903)									
EB2339753-026	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2339753-048	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5514336)									
EB2340121-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2339715-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	3.38	3.35	0.9	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5513896)									
EB2339753-026	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2339753-048	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.03	0.03	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA002: pH 1:5 (Soils) (QCLot: 5505464)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010: Conductivity (1:5) (QCLot: 5505463)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	101	97.0	103
ED040T : Total Sulfate by ICPAES (QCLot: 5505470)								
ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	<100	433.3515 mg/kg	96.9	79.0	121
ED045G: Chloride by Discrete Analyser (QCLot: 5505466)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	50 mg/kg	100.0	83.0	119
				<10	5000 mg/kg	104	83.0	119
ED093S: Soluble Major Cations (QCLot: 5505465)								
ED093S: Calcium	7440-70-2	10	mg/kg	<10	250 mg/kg	97.7	80.0	120
ED093S: Magnesium	7439-95-4	10	mg/kg	<10	250 mg/kg	104	80.0	120
ED093S: Sodium	7440-23-5	10	mg/kg	<10	250 mg/kg	92.1	80.0	120
ED093S: Potassium	7440-09-7	10	mg/kg	<10	250 mg/kg	93.2	80.0	120
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5505462)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	115	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	80.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	101	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	83.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	100	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	97.9	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5505462)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	106	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	64.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5505462) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5505462)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	117	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.9	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.3	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	129	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5505462)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	100	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	105	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	109	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	85.8	54.8	124

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EA005P: pH by PC Titrator (QCLot: 5511634)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	101	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5511631)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	96.1	90.0	106
				<1	24800 µS/cm	99.5	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5504035)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	103	88.0	112
				<10	2000 mg/L	97.2	80.9	118
				<10	2340 mg/L	101	80.8	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5504036)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	103	82.0	120
				<1	987 mg/L	100	85.0	115

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED037P: Alkalinity by PC Titrator (QCLot: 5511633)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	97.5	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5513901)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.9	85.0	118
				<1	100 mg/L	90.0	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 5513899)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.5	90.0	115
				<1	1000 mg/L	99.5	90.0	115
ED093F: Dissolved Major Cations (QCLot: 5515399)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5507445)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.4	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	102	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 5511632)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	97.0	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5514333)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	98.7	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5513903)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	100	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5514336)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.4	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5513896)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.2	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5513290)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	90.6	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	110	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	79.4	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	119	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	113	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	125	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5513290)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	86.4	73.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5513290) - continued								
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	128	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	86.0	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	93.2	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	82.8	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	103	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	102	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	98.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	87.2	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	89.2	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	126	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5513290)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	135	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	139	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	128	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	133	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	134	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	# 146	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	130	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5513290)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	140	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	134	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	132	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	127	53.1	133
EP231P: PFAS Sums (QCLot: 5513290)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5505462)							
EB2339711-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	100.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	79.9	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	124	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	# 66.8	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	75.3	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	117	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5505462)							
EB2339711-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	121	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	107	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	128	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	127	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	102	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	95.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	93.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	108	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	116	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	118	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5505462)							
EB2339711-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	120	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	107	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	129	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	92.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	142	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	128	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5505462)							
EB2339711-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	104	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	92.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	110	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	# 171	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5513901)							
EB2339753-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5513899)							
EB2339753-004	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5507445)							
EB2339725-010	ADB PW4	EG020A-T: Manganese	7439-96-5	1 mg/L	104	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5511632)							
EB2339725-010	ADB PW4	EK040P: Fluoride	16984-48-8	5 mg/L	79.8	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5514333)							
EB2340121-006	Anonymous	EK055G: Ammonia as N	7664-41-7	2 mg/L	106	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5513903)							
EB2339753-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	123	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5514336)							
EB2340121-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	101	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5513896)							
EB2339753-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	116	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2339725**	Page	: 1 of 13
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 19-Dec-2023
Site	: ----	Issue Date	: 05-Jan-2024
Sampler	: DANIEL PAPINCZAK	No. of samples received	: 12
Order number	: ----	No. of samples analysed	: 12

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
ED040T : Total Sulfate by ICPAES	EB2339725--001	EDC-SED-1	**Sulfate as SO4 2-**	14808-79-8	47.5 %	0% - 20%	**RPD exceeds LOR based limits**
ED093S: Soluble Major Cations	EB2339725--001	EDC-SED-1	**Calcium**	7440-70-2	42.4 %	0% - 20%	**RPD exceeds LOR based limits**
ED093S: Soluble Major Cations	EB2339725--001	EDC-SED-1	**Magnesium**	7439-95-4	26.8 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2339711--002	Anonymous	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	66.8 %	70.0-132%	**Recovery less than lower data quality objective**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EB2339711--002	Anonymous	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	171 %	70.0-130%	**Recovery greater than upper data quality objective**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-5513290-002	----	**N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)**	2355-31-9	146 %	65.0-136%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2339753--004	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2339753--004	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / **Container** / Client Sample ID(s)		*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA002: pH 1:5 (Soils)							
Soil Glass Jar - Unpreserved							
EDC-SED-1,	EDC-SED-2,	20-Dec-2023	18-Dec-2023	**2**	----	----	----
EDC-SED-3,	EDC-SED-4,						
EDC-SED-5,	EDC-SED-6,						
EDC-SED-7,	SED-QC01_1112						
EA010: Conductivity (1:5)							

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA010: Conductivity (1:5) - Analysis Holding Time Compliance						
Soil Glass Jar - Unpreserved						
EDC-SED-1, EDC-SED-2, EDC-SED-3, EDC-SED-4, EDC-SED-5, EDC-SED-6, EDC-SED-7, SED-QC01_1112	20-Dec-2023	18-Dec-2023	**2**	----	----	----
ED040: Sulfur as SO4 2-						
Soil Glass Jar - Unpreserved						
EDC-SED-1, EDC-SED-2, EDC-SED-3, EDC-SED-4, EDC-SED-5, EDC-SED-6, EDC-SED-7, SED-QC01_1112	20-Dec-2023	18-Dec-2023	**2**	----	----	----

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
ADB PW3, ADB PW4, ADB PW5, ADB PW6	----	----	----	23-Dec-2023	11-Dec-2023	**12**
EA015: Total Dissolved Solids dried at 180 ± 5 °C						
Clear Plastic Bottle - Natural						
ADB PW3, ADB PW4, ADB PW5, ADB PW6	----	----	----	19-Dec-2023	18-Dec-2023	**1**
EA025: Total Suspended Solids dried at 104 ± 2°C						
Clear Plastic Bottle - Natural						
ADB PW3, ADB PW4, ADB PW5, ADB PW6	----	----	----	19-Dec-2023	18-Dec-2023	**1**
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
ADB PW3, ADB PW4, ADB PW5, ADB PW6	----	----	----	28-Dec-2023	18-Dec-2023	**10**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
ADB PW3, ADB PW4, ADB PW5, ADB PW6	----	----	----	22-Dec-2023	13-Dec-2023	**9**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
ADB PW3, ADB PW4, ADB PW5, ADB PW6	----	----	----	22-Dec-2023	13-Dec-2023	**9**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	19	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	19	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)		*Sample Date*	*Extraction / Preparation*			*Analysis*		
			Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA002: pH 1:5 (Soils)								
Soil Glass Jar - Unpreserved (EA002)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**20-Dec-2023**	18-Dec-2023	×	**20-Dec-2023**	20-Dec-2023	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							
EA010: Conductivity (1:5)								
Soil Glass Jar - Unpreserved (EA010)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**20-Dec-2023**	18-Dec-2023	×	**20-Dec-2023**	17-Jan-2024	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**----**	----	----	**20-Dec-2023**	25-Dec-2023	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							
ED040: Sulfur as SO4 2-								
Soil Glass Jar - Unpreserved (ED040T)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**20-Dec-2023**	18-Dec-2023	×	**20-Dec-2023**	17-Jan-2024	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser								
Soil Glass Jar - Unpreserved (ED045G)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**20-Dec-2023**	08-Jan-2024	✓	**29-Dec-2023**	17-Jan-2024	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							
ED093S: Soluble Major Cations								
Soil Glass Jar - Unpreserved (ED093S)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**20-Dec-2023**	08-Jun-2024	✓	**02-Jan-2024**	08-Jun-2024	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**20-Dec-2023**	08-Jun-2024	✓	**27-Dec-2023**	29-Jan-2024	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**20-Dec-2023**	08-Jun-2024	✓	**27-Dec-2023**	29-Jan-2024	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**20-Dec-2023**	08-Jun-2024	✓	**27-Dec-2023**	29-Jan-2024	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**20-Dec-2023**	08-Jun-2024	✓	**27-Dec-2023**	29-Jan-2024	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
EDC-SED-1,	EDC-SED-2,	**11-Dec-2023**	**20-Dec-2023**	08-Jun-2024	✓	**27-Dec-2023**	29-Jan-2024	✓
EDC-SED-3,	EDC-SED-4,							
EDC-SED-5,	EDC-SED-6,							
EDC-SED-7,	SED-QC01_1112							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P)								
ADB PW3,	ADB PW4,	**11-Dec-2023**	**----**	----	----	**23-Dec-2023**	11-Dec-2023	×
ADB PW5,	ADB PW6							
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P)								
ADB PW3,	ADB PW4,	**11-Dec-2023**	**----**	----	----	**23-Dec-2023**	08-Jan-2024	✓
ADB PW5,	ADB PW6							
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Clear Plastic Bottle - Natural (EA015H)								
ADB PW3,	ADB PW4,	**11-Dec-2023**	**----**	----	----	**19-Dec-2023**	18-Dec-2023	×
ADB PW5,	ADB PW6							
EA025: Total Suspended Solids dried at 104 ± 2°C								
Clear Plastic Bottle - Natural (EA025LL)								
ADB PW3,	ADB PW4,	**11-Dec-2023**	**----**	----	----	**19-Dec-2023**	18-Dec-2023	×
ADB PW5,	ADB PW6							
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
ADB PW3,	ADB PW4,	**11-Dec-2023**	**----**	----	----	**23-Dec-2023**	25-Dec-2023	✓
ADB PW5,	ADB PW6							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
ADB PW3,	ADB PW4,	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Jan-2024	✓
ADB PW5,	ADB PW6							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
ADB PW3,	ADB PW4,	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Jan-2024	✓
ADB PW5,	ADB PW6							
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
ADB PW3,	ADB PW4,	**11-Dec-2023**	**----**	----	----	**28-Dec-2023**	18-Dec-2023	×
ADB PW5,	ADB PW6							
EG020T: Total Metals by ICP-MS								
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)								
ADB PW3,	ADB PW4,	**11-Dec-2023**	**20-Dec-2023**	08-Jun-2024	✓	**30-Dec-2023**	08-Jun-2024	✓
ADB PW5,	ADB PW6							
EK040P: Fluoride by PC Titrator								
Clear Plastic Bottle - Natural (EK040P)								
ADB PW3,	ADB PW4,	**11-Dec-2023**	**----**	----	----	**23-Dec-2023**	08-Jan-2024	✓
ADB PW5,	ADB PW6							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
ADB PW3, ADB PW4, ADB PW5, ADB PW6	**11-Dec-2023**	**----**	----	----	**23-Dec-2023**	08-Jan-2024	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
ADB PW3, ADB PW4, ADB PW5, ADB PW6	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	13-Dec-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
ADB PW3, ADB PW4, ADB PW5, ADB PW6	**11-Dec-2023**	**----**	----	----	**23-Dec-2023**	08-Jan-2024	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
ADB PW3, ADB PW4, ADB PW5, ADB PW6	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	13-Dec-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT)							
ADB PW3, ADB PW4, ADB PW5, ADB PW6	**11-Dec-2023**	**29-Dec-2023**	08-Jun-2024	✓	**03-Jan-2024**	08-Jun-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT)							
ADB PW3, ADB PW4, ADB PW5, ADB PW6	**11-Dec-2023**	**29-Dec-2023**	08-Jun-2024	✓	**03-Jan-2024**	08-Jun-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT)							
ADB PW3, ADB PW4, ADB PW5, ADB PW6	**11-Dec-2023**	**29-Dec-2023**	08-Jun-2024	✓	**03-Jan-2024**	08-Jun-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT)							
ADB PW3, ADB PW4, ADB PW5, ADB PW6	**11-Dec-2023**	**29-Dec-2023**	08-Jun-2024	✓	**03-Jan-2024**	08-Jun-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT)							
ADB PW3, ADB PW4, ADB PW5, ADB PW6	**11-Dec-2023**	**29-Dec-2023**	08-Jun-2024	✓	**03-Jan-2024**	08-Jun-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Cations - soluble by ICP-AES	ED093S	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride Soluble By Discrete Analyser	ED045G	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate as SO4 2- Total	ED040T	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Cations - soluble by ICP-AES	ED093S	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride Soluble By Discrete Analyser	ED045G	2	8	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	8	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate as SO4 2- Total	ED040T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Cations - soluble by ICP-AES	ED093S	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride Soluble By Discrete Analyser	ED045G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate as SO4 2- Total	ED040T	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	19	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP) - Continued							
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Fluoride by Auto Titrator	EK040P	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	19	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Sulfate as SO4 2- Total	ED040T	SOIL	In house: Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.
Cations - soluble by ICP-AES	ED093S	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010 (ICPAES) Water extracts of the soil are analyzed for major cations by ICPAES. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (Low Level)	EA025LL	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . Extra volume is used to counter the effect from saline water. This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2339725**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BC200153.03	Page	: 1 of 5
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V4)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DANIEL PAPINCZAK		

Dates

Date Samples Received	: 19-Dec-2023 11:30	Issue Date	: 19-Dec-2023
Client Requested Due Date	: 03-Jan-2024	Scheduled Reporting Date	: **03-Jan-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 10	Temperature	: 4.5°C, 12.7°C, 5.7°C, 5.5°C, 4.8°C, 6.7°C, 2.6°C, 11.9°C, 10.2°C, 10.1°C, 6.7°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 12 / 12

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples were originally received by ALS GLADSTONE on 18/12/23 and have been forwarded to ALS Brisbane for analysis. Temperature on arrival in ALS Brisbane has been noted above.**
- **Sample "SED_QC02_1112" has been forwarded to Eurofins , as requested. Please note that this will incur a freight forwarding fee.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - ED040T Sulfate Total	SOIL - ED045G (solids) Chloride Soluble by Discrete Analyser	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - IN-4S pH plus EC (1:5)	SOIL - NT-1S Major Cations (Ca, Mg, Na, K)
EB2339725-001	11-Dec-2023 00:00	EDC-SED-1	✓	✓	✓	✓	✓	✓
EB2339725-002	11-Dec-2023 00:00	EDC-SED-2	✓	✓	✓	✓	✓	✓
EB2339725-003	11-Dec-2023 00:00	EDC-SED-3	✓	✓	✓	✓	✓	✓
EB2339725-004	11-Dec-2023 00:00	EDC-SED-4	✓	✓	✓	✓	✓	✓
EB2339725-005	11-Dec-2023 00:00	EDC-SED-5	✓	✓	✓	✓	✓	✓
EB2339725-006	11-Dec-2023 00:00	EDC-SED-6	✓	✓	✓	✓	✓	✓
EB2339725-007	11-Dec-2023 00:00	EDC-SED-7	✓	✓	✓	✓	✓	✓
EB2339725-008	11-Dec-2023 00:00	SED-QC01_1112	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EA005P pH (Auto Titrator)
EB2339725-009	11-Dec-2023 00:00	ADB PW3	✓
EB2339725-010	11-Dec-2023 00:00	ADB PW4	✓
EB2339725-011	11-Dec-2023 00:00	ADB PW5	✓
EB2339725-012	11-Dec-2023 00:00	ADB PW6	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK071G Reactive Phosphorus by Discrete analyser	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride	WATER - NT-04 Nitrite and Nitrate
EB2339725-009	11-Dec-2023 00:00	ADB PW3	✓	✓	✓	✓	✓	✓	✓
EB2339725-010	11-Dec-2023 00:00	ADB PW4	✓	✓	✓	✓	✓	✓	✓
EB2339725-011	11-Dec-2023 00:00	ADB PW5	✓	✓	✓	✓	✓	✓	✓
EB2339725-012	11-Dec-2023 00:00	ADB PW6	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA025LL Suspended Solids - Low Level	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29
EB2339725-009	11-Dec-2023 00:00	ADB PW3	✓	✓
EB2339725-010	11-Dec-2023 00:00	ADB PW4	✓	✓
EB2339725-011	11-Dec-2023 00:00	ADB PW5	✓	✓
EB2339725-012	11-Dec-2023 00:00	ADB PW6	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received Date	Samples Received Evaluation	Instructions Received Date	Instructions Received Evaluation
EA002: pH (1:5)							
EDC-SED-1	Soil Glass Jar - Unpreserved	18-Dec-2023	18-Dec-2023	19-Dec-2023	×	----	----
EDC-SED-2	Soil Glass Jar - Unpreserved	18-Dec-2023	18-Dec-2023	19-Dec-2023	×	----	----
EDC-SED-3	Soil Glass Jar - Unpreserved	18-Dec-2023	18-Dec-2023	19-Dec-2023	×	----	----
EDC-SED-4	Soil Glass Jar - Unpreserved	18-Dec-2023	18-Dec-2023	19-Dec-2023	×	----	----
EDC-SED-5	Soil Glass Jar - Unpreserved	18-Dec-2023	18-Dec-2023	19-Dec-2023	×	----	----
EDC-SED-6	Soil Glass Jar - Unpreserved	18-Dec-2023	18-Dec-2023	19-Dec-2023	×	----	----
EDC-SED-7	Soil Glass Jar - Unpreserved	18-Dec-2023	18-Dec-2023	19-Dec-2023	×	----	----
SED-QC01_1112	Soil Glass Jar - Unpreserved	18-Dec-2023	18-Dec-2023	19-Dec-2023	×	----	----
EA010: Electrical Conductivity (1:5)							
EDC-SED-1	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	×	----	----
EDC-SED-2	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	×	----	----
EDC-SED-3	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	×	----	----
EDC-SED-4	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	×	----	----
EDC-SED-5	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	×	----	----
EDC-SED-6	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	×	----	----
EDC-SED-7	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	×	----	----
SED-QC01_1112	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	×	----	----

ED040T: Sulfate as SO4 2- Total							
EDC-SED-1	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	✗	----	----
EDC-SED-2	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	✗	----	----
EDC-SED-3	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	✗	----	----
EDC-SED-4	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	✗	----	----
EDC-SED-5	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	✗	----	----
EDC-SED-6	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	✗	----	----
EDC-SED-7	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	✗	----	----
SED-QC01_1112	Soil Glass Jar - Unpreserved	18-Dec-2023	15-Jan-2024	19-Dec-2023	✗	----	----

Matrix: **WATER** Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA005-P: pH by Auto Titrator							
ADB PW3	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✗	----	----
ADB PW4	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✗	----	----
ADB PW5	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✗	----	----
ADB PW6	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✗	----	----
EA015H: Total Dissolved Solids (High Level)							
ADB PW3	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
ADB PW4	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
ADB PW5	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
ADB PW6	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
EA025LL: Suspended Solids (Low Level)							
ADB PW3	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
ADB PW4	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
ADB PW5	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
ADB PW6	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
ED093F: Major Cations - Dissolved							
ADB PW3	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
ADB PW4	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
ADB PW5	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
ADB PW6	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✗	----	----
EK057G: Nitrite as N by Discrete Analyser							
ADB PW3	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✗	----	----
ADB PW4	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✗	----	----
ADB PW5	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✗	----	----
ADB PW6	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✗	----	----
EK071G: Reactive Phosphorus as P-By Discrete Analyser							
ADB PW3	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✗	----	----
ADB PW4	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✗	----	----
ADB PW5	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✗	----	----
ADB PW6	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✗	----	----

Requested Deliverables

CS ENERGY ENVIRONMENTAL DATA

- *AU Certificate of Analysis - NATA (COA)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	CSEnergyEnvironmentData@csenergy.com.au
- Chain of Custody (CoC) (COC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ESDAT (ESDAT)	Email	CSEnergyEnvironmentData@csenergy.com.au

ESDAT REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au

INVOICES

- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au

INVOICES & RESULTS

- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au

LUKE AMIES

- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	Callide EDC Sampling
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	1 of 2
Number of Eskies:	1

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

Please Split Reports:	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	50-250ml Plastic (PFAS)	Jars Plastic	Jars GLASS	Soil Testing: ALS Suite NT-1S: Major Cations (Ca, Mg, Na, K)	Soil Testing: Chloride	Soil Testing: Sulfate at SO4	Soil Testing: ALS Suite IN-4S: pH/EC	Bore Water: pH (EA005P)	Bore Water: EC (EA010P)	Bore Water: TDS - Standard (EA015H)	Bore Water: Suspended Solids - Low Level (EA025LL)	Bore Water: Ammonia (EK055G)	Bore Water: Reactive P (EK071G)	Bore Water: Nitrate and Nitrite (NT-04)	Bore Water: Major Anions/Cations (NT-01 and NT02A)	Bore Water: Ionic Balance (EN055-PG)	Bore Water: Total Metals (Fe and Mn) (EG020T)	Bore Water: PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOPI)) + TOF (EP040)	SOIL: PFAS (EP231X)	HOLD
1	EDC-SED-1	11/12/2023	s					1	1	x	x	x	x													x	
2	EDC-SED-2	11/12/2023	s					1	1	x	x	x	x													x	
3	EDC-SED-3	11/12/2023	s					1	1	x	x	x	x													x	
4	EDC-SED-4	11/12/2023	s					1	1	x	x	x	x													x	
5	EDC-SED-5	11/12/2023	s					1	1	x	x	x	x													x	
6	EDC-SED-6	11/12/2023	s					1	1	x	x	x	x													x	
7	EDC-SED-7	11/12/2023	s					1	1	x	x	x	x													x	
8	SED-QC01_1112	11/12/2023	s					1	1	x	x	x	x													x	
9	ADB PW3	11/12/2023	w	1	1	1	2							x	x	x	x	x	x	x	x	x	x	x			
10	ADB PW4	11/12/2023	w	1	1	1	2							x	x	x	x	x	x	x	x	x	x	x			
11	ADB PW5	11/12/2023	w	1	1	1	2							x	x	x	x	x	x	x	x	x	x	x			
12	ADB PW6	11/12/2023	w	1	1	1	2							x	x	x	x	x	x	x	x	x	x	x			

Relinquished By: Dan Papinczak
0439 115 598
SIGNATURE
14-Dec-23

Received By
SIGNATURE
DATE 16/12/23

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

Recd: JD 19/12 1130

Environmental Division
Brisbane
Work Order Reference
EB2339725

Telephone : +61-7-3243 7222

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

HT

CERTIFICATE OF ANALYSIS

Work Order	: **EB2400645**	Page	: 1 of 8
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 09-Jan-2024 13:48
Order number	: ----	Date Analysis Commenced	: 11-Jan-2024
C-O-C number	: ----	Issue Date	: 18-Jan-2024 12:57
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V4		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Soil Preparation, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X (TOP) PFAS TOPA: Sample 'EDC-SED-6' (EB2400645-001) required dilution prior to extraction due to the presence of high level contaminants. LOR values have been adjusted accordingly. The LOR of PFPeA has been raised further due to additional matrix interferences.
- EP231X-SUT PFAS Super Ultra Trace: Whole bottle extraction was not possible for sample 'EDC-SED-6' (EB2400645-001). Sample required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP040: Total Organic Fluorine (TOF) in solids represents the total fluorine in the organic forms extracted by the method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- EN60: Where leachable PFAS analysis is requested, centrifugation rather than pressure filtration is used as the default approach for removal of particulates, in line with AS 4439.3.

Analytical Results

Sub-Matrix: ASLP LEACHATE (Matrix: WATER)				Sample ID	EDC-SED-6	----	----	----	----
				Sampling date / time	11-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2400645-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.202**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.236**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**1.88**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.130**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**3.99**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0032	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.0474**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0570**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0401**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.309**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0913**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0032	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0032	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0032	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0032	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0032	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0080	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0032	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.008	----	----	----	----

Analytical Results

Sub-Matrix: ASLP LEACHATE (Matrix: WATER)				Sample ID	EDC-SED-6	----	----	----	----
				Sampling date / time	11-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2400645-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.008	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.008	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.008	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0032	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0032	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.003	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.003	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.003	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.003	----	----	----	----
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**5.87**	----	----	----	----
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**6.62**	----	----	----	----
^ **Sum of PFAS**	----	0.0002	µg/L		**6.98**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**90.1**	----	----	----	----
13C8-PFOA	----	0.0005	%		**87.7**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	EDC-SED-6	----	----	----	----
				Sampling date / time	11-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2400645-001	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**30.8**	----	----	----	----
EN60: ASLP Leaching Procedure - Inorganics/PFAS (Plastic Vessel)									
Final pH	----	0.1	pH Unit		**7.3**	----	----	----	----
EP040: Total Organic Fluorine (TOF)									
Total Organic Fluorine	----	1.0	mg/kg		<1.0	----	----	----	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0089**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0071**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0435**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0027**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.158**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0005	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.003	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0013	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0100**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0011**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0032**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0005	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0005	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	EDC-SED-6	----	----	----	----
				Sampling date / time	11-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2400645-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0013	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0013	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0013	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0013	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0013	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0005	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.234**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.202**	----	----	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		**0.234**	----	----	----	----
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		**0.150**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	EDC-SED-6	----	----	----	----
				Sampling date / time	11-Dec-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2400645-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**105**	**----**	**----**	**----**	**----**
13C8-PFOA	----	0.0002	%		**78.8**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: ASLP LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	47	129
13C8-PFOA	----	56	128

QUALITY CONTROL REPORT

Work Order	: **EB2400645**	Page	: 1 of 7
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 09-Jan-2024
Order number	: ----	Date Analysis Commenced	: 11-Jan-2024
C-O-C number	: ----	Issue Date	: 18-Jan-2024
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V4		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Soil Preparation, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP040: Total Organic Fluorine (TOF) (QC Lot: 5534559)									
EB2400645-001	EDC-SED-6	EP040: Total Organic Fluorine	----	1	mg/kg	<1.0	<1.0	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5534561)									
EB2400645-001	EDC-SED-6	EA055: Moisture Content	----	0.1	%	30.8	32.4	5.0	0% - 20%
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5534560)									
EB2400645-001	EDC-SED-6	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002 (0.0005)*	mg/kg	0.0089	0.0064	33.3	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002 (0.0005)*	mg/kg	0.0071	0.0054	27.3	0% - 50%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002 (0.0005)*	mg/kg	0.0435	0.0366	17.3	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002 (0.0005)*	mg/kg	0.0027	0.0025	9.1	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002 (0.0005)*	mg/kg	0.158	0.164	4.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002 (0.0005)*	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5534560)									
EB2400645-001	EDC-SED-6	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002 (0.0010)*	mg/kg	<0.0013	<0.0010	26.1	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002 (0.0005)*	mg/kg	0.0100	0.0075	29.2	0% - 50%

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5534560) - continued									
EB2400645-001	EDC-SED-6	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002 (0.0005)*	mg/kg	0.0011	0.0008	33.5	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002 (0.0005)*	mg/kg	0.0032	0.0029	10.2	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002 (0.0005)*	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002 (0.0005)*	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002 (0.0005)*	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002 (0.0005)*	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002 (0.0005)*	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005 (0.0013)*	mg/kg	<0.0013	<0.0013	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001 (0.003)*	mg/kg	<0.003	<0.003	0.0	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 5534560)									
EB2400645-001	EDC-SED-6	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002 (0.0005)*	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002 (0.0005)*	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002 (0.0005)*	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005 (0.0013)*	mg/kg	<0.0013	<0.0013	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005 (0.0013)*	mg/kg	<0.0013	<0.0013	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005 (0.0013)*	mg/kg	<0.0013	<0.0013	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005 (0.0013)*	mg/kg	<0.0013	<0.0013	0.0	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5534560)									
EB2400645-001	EDC-SED-6	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5534560) - continued									
EB2400645-001	EDC-SED-6	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 5534560)									
EB2400645-001	EDC-SED-6	EP231X: Sum of PFAS	----	0.0002 (0.0005)*	mg/kg	0.234	0.226	3.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002 (0.0005)*	mg/kg	0.202	0.201	0.4	0% - 20%
		EP231X: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002 (0.0005)*	mg/kg	0.234	0.226	3.6	0% - 20%
		EP231X: Sum of TOP C4 - C14 as Fluorine	----	0.0002 (0.0005)*	mg/kg	0.150	0.144	3.4	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP040: Total Organic Fluorine (TOF) (QCLot: 5534559)								
EP040: Total Organic Fluorine	----	1	mg/kg	<1.0	2.385 mg/kg	92.1	70.0	120
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5534560)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00237 mg/kg	58.0	43.5	125
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00232 mg/kg	74.7	36.6	118
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5534560)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	78.5	41.4	126
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5534560)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5534560) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5534560)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00018 mg/kg	2.9	0	200
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5543837)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	130	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	97.4	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	86.5	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	114	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	107	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	122	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5543837)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	104	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	104	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	94.0	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	102	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	103	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	84.8	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	98.0	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	96.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	107	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	112	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5543837)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	95.2	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	72.2	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	81.8	57.9	141

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5543837) - continued								
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	122	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	117	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	118	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	112	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5543837)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	85.1	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	133	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	123	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	118	53.1	133
EP231P: PFAS Sums (QCLot: 5543837)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2400645**	Page	: 1 of 5
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BC200153.03	Date Samples Received	: 09-Jan-2024
Site	: ----	Issue Date	: 18-Jan-2024
Sampler	: DANIEL PAPINCZAK	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA055: Moisture Content (Dried @ 105-110°C)						
Soil Glass Jar - Unpreserved						
EDC-SED-6	----	----	----	11-Jan-2024	25-Dec-2023	**17**
EP040: Total Organic Fluorine (TOF)						
HDPE Soil Jar						
EDC-SED-6	11-Jan-2024	08-Jan-2024	**3**	16-Jan-2024	08-Jan-2024	**8**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type / Analytical Methods	Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Matrix Spikes (MS)						
Total Organic Fluorine (TOF)	EP040	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Quality Control Sample Type / Analytical Methods	Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
EDC-SED-6	**11-Dec-2023**	**----**	----	**----**	**11-Jan-2024**	25-Dec-2023	×
EN60: ASLP Leaching Procedure - Inorganics/PFAS (Plastic Vessel)							
Non-Volatile Leach: 180 day HT (e.g. PFAS, metals ex.Hg) (EN60a-P)							
EDC-SED-6	**11-Dec-2023**	**15-Jan-2024**	08-Jun-2024	✓	**----**	----	**----**

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP040: Total Organic Fluorine (TOF)							
HDPE Soil Jar (EP040)							
EDC-SED-6	**11-Dec-2023**	**11-Jan-2024**	08-Jan-2024	×	**16-Jan-2024**	08-Jan-2024	×
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X (TOP))							
EDC-SED-6	**11-Dec-2023**	**11-Jan-2024**	08-Jun-2024	✓	**16-Jan-2024**	20-Feb-2024	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X (TOP))							
EDC-SED-6	**11-Dec-2023**	**11-Jan-2024**	08-Jun-2024	✓	**16-Jan-2024**	20-Feb-2024	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X (TOP))							
EDC-SED-6	**11-Dec-2023**	**11-Jan-2024**	08-Jun-2024	✓	**16-Jan-2024**	20-Feb-2024	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X (TOP))							
EDC-SED-6	**11-Dec-2023**	**11-Jan-2024**	08-Jun-2024	✓	**16-Jan-2024**	20-Feb-2024	✓
EP231_TOP_P: PFAS Sums							
HDPE Soil Jar (EP231X (TOP))							
EDC-SED-6	**11-Dec-2023**	**11-Jan-2024**	08-Jun-2024	✓	**16-Jan-2024**	20-Feb-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT)							
EDC-SED-6	**15-Jan-2024**	**17-Jan-2024**	13-Jul-2024	✓	**17-Jan-2024**	13-Jul-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT)							
EDC-SED-6	**15-Jan-2024**	**17-Jan-2024**	13-Jul-2024	✓	**17-Jan-2024**	13-Jul-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT)							
EDC-SED-6	**15-Jan-2024**	**17-Jan-2024**	13-Jul-2024	✓	**17-Jan-2024**	13-Jul-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT)							
EDC-SED-6	**15-Jan-2024**	**17-Jan-2024**	13-Jul-2024	✓	**17-Jan-2024**	13-Jul-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT)							
EDC-SED-6	**15-Jan-2024**	**17-Jan-2024**	13-Jul-2024	✓	**17-Jan-2024**	13-Jul-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	1	100.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Organic Fluorine (TOF)	EP040	0	1	0.00	5.00	×	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	1	0.00	10.00	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	1	100.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	1	0.00	5.00	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Organic Fluorine (TOF)	EP040	SOIL	In house: Fluorinated organic compounds are isolated from the sample by solvent extraction. Hydropyrolytic combustion of the soil extract converts organic forms of fluorine to hydrogen fluoride (HF). The HF is adsorbed in a trapping solution and the total fluoride concentration determined by Ion Chromatography (IC).
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	SOIL	In house, following oxidation per Houtz,Erika F.; Sedlak,David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349.: A portion of the oxidised sample is mixed with methanol (1:1) prior to analysis by LC-Electrospray-MS-MS,Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	SOIL	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
ASLP for Non & Semivolatile Analytes - Plastic Leaching Vessel	EN60a-P	SOIL	In house QWI-EN/60 referenced to AS4439.3 Preparation of Leachates.
TOP Digest for PFAS on soil extract.	ORG70-S	SOIL	In-House Extraction followed by digestion with oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342-9349. A soil extract is taken to near dryness and made up to 5 mL with reagents. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.
QuECheRS Extraction of Solids for Total Organic Fluorine	ORG71-TOF	SOIL	In house: Extraction of homogenised aliquot of soil by QuECheRS for Total Organic Fluorine.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	SOIL	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2400645**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BC200153.03	Page	: 1 of 3
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V4)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DANIEL PAPINCZAK		

Dates

Date Samples Received	: 09-Jan-2024 13:48	Issue Date	: 10-Jan-2024
Client Requested Due Date	: 17-Jan-2024	Scheduled Reporting Date	: **17-Jan-2024**

Delivery Details

Mode of Delivery	: Samples On Hand	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: ----
Receipt Detail	: REBATCH	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **This workorder has been created to rebatch sample "EDC-SED-6" from EB2339725.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - EN60a-P ASLP Leachate Procedure - Plastic Leaching	SOIL - EP040 Total Organic Fluorine (TOF)	SOIL - EP231X (TOP) (solids) PFAS - Total Oxidisable Precursor (TOP) Assay	SOIL - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29
EB2400645-001	11-Dec-2023 00:00	EDC-SED-6	✓	✓	✓	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA055: Moisture Content							
EDC-SED-6	Soil Glass Jar - Unpreserved	----	25-Dec-2023	09-Jan-2024	✘	10-Jan-2024	✘
EP040: Total Organic Fluorine (TOF)							
EDC-SED-6	HDPE Soil Jar	08-Jan-2024	08-Jan-2024	09-Jan-2024	✘	10-Jan-2024	✘

Requested Deliverables

CS ENERGY ENVIRONMENTAL DATA

- *AU Certificate of Analysis - NATA (COA)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	CSEnergyEnvironmentData@csenergy.com.au
- Chain of Custody (CoC) (COC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ESDAT (ESDAT)	Email	CSEnergyEnvironmentData@csenergy.com.au

ESDAT REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au

INVOICES

- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au

INVOICES & RESULTS

- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au

LUKE AMIES

- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au

From: Luke Amies <lamies@epicenvironmental.com.au>
Sent: Tuesday, 9 January 2024 1:48 PM
To: Nathan King <Nathan.King@alsglobal.com>; ALSEnviro Brisbane <ALSEnviro.Brisbane@alsglobal.com>
Subject: [EXTERNAL] - RE: RESULTS & EDD for ALS Workorder : EB2339725 | Your Reference: BC200153.03

Hi Nathan,

Can we please organise additional analysis on sample EDC-SED-6 (EB2339725006) as follows:

- TOPA
- TOF
- ASLP (DI) PFAS SUT

Regards,

Luke Amies
Principal Environmental Scientist
BEnvSc (Hons), Licensed Asbestos Assessor
CEnvP Site Contamination Specialist

Mobile: 0447 661 021
Email: lamies@epicenvironmental.com.au

Environmental Division
Brisbane
Work Order Reference
EB2400645

Telephone : + 61-7-3243 7222

CERTIFICATE OF ANALYSIS

Work Order	: **EB2339753**	Page	: 1 of 53
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 19-Dec-2023 11:30
Order number	: ----	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: ----	Issue Date	: 11-Jan-2024 18:30
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V4		
No. of samples received	: 62		
No. of samples analysed	: 62		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EK055G (Ammonia as N): Sample BD02_0812 (EB2339753-059) was diluted due to matrix interference. LOR adjusted accordingly.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- The presence of high SO4 may bias the EC low.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EP231-X-SUT-PFAS: High LCS recovery deemed acceptable as all associated analyte results are less than LOR
- EP231X-SUT-PFAS: Particular samples showed matrix interference indicated by internal standard recovery lower than 50%. This is deemed acceptable as all associated analytes are less than the limit of reporting.
- EP231X-SUT - PFAS: Particular samples required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly. The LOR for particular analytes has been raised in particular samples due to matrix interference.
- EP231X-SUT-PFAS: Sample 'MW32' (EB2339753-019) and 'MW84' (EB2339753-038) required dilution due to the presence of high-level contaminants. LOR values have been adjusted accordingly. Whole bottle extraction was not possible.
- EP231X-SUT PFAS Super Ultra Trace: The LOR of 6:2 FTS has been raised in samples 'MW85' (EB2339753-039) and 'RN13030697' (EB2339753-047) due to matrix interference.
- EP231X-SUT PFAS Super Ultra Trace: Particular samples required dilution prior to analysis due to matrix interferences (Internal standard suppresion). LOR values have been adjusted accordingly.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW45	Notch-V1	Notch-V2	PW2	SW13
				Sampling date / time	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-001	EB2339753-002	EB2339753-003	EB2339753-004	EB2339753-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		9.14	7.99	8.15	8.04	8.29
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		1420	20700	22400	11500	16500
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		836	17200	16200	9460	10800
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L		4	2	25	11	37
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		74	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		249	420	395	91	290
Total Alkalinity as CaCO3	----	1	mg/L		323	420	395	91	290
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		64	2600	2810	2690	1100
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		247	6140	6090	2800	4750
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		16	518	344	649	123
Magnesium	7439-95-4	1	mg/L		44	975	893	413	514
Sodium	7440-23-5	1	mg/L		243	2810	3230	1240	2340
Potassium	7440-09-7	1	mg/L		5	2	3	29	3
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		0.034	0.272	0.703	0.061	0.294
Iron	7439-89-6	0.05	mg/L		0.11	0.15	0.61	0.20	1.23
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		1.1	0.2	0.2	1.3	0.4
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	0.05	0.06	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	SW45	Notch-V1	Notch-V2	PW2	SW13
			Sampling date / time	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-001	EB2339753-002	EB2339753-003	EB2339753-004	EB2339753-005
				Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	**0.02**	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	**0.02**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.02**	<0.01	**0.01**	<0.01	**0.01**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**14.8**	**236**	**238**	**137**	**163**
ø Total Cations	----	0.01	meq/L	**15.1**	**228**	**231**	**121**	**150**
ø Ionic Balance	----	0.01	%	**1.22**	**1.58**	**1.48**	**6.11**	**3.96**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	**0.0589**	**0.0148**	**0.0217**	<0.0240	**0.0550**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	**0.0304**	**0.0050**	**0.0074**	<0.0065	**0.0228**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	**0.180**	**0.0246**	**0.0578**	**0.0302**	**0.163**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	**0.0114**	<0.0010	<0.0016	<0.0016	<0.0080
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.141**	**0.0564**	**0.0426**	**0.0629**	**0.148**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.110	<0.0079	<0.0080	<0.0240	<0.0160
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	**0.387**	<0.0016	<0.0016	<0.0105	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	**0.141**	<0.0005	<0.0005	**0.0040**	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	**0.162**	<0.0005	<0.0016	**0.0051**	**0.0054**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	**0.0539**	<0.0020	<0.0035	**0.0032**	**0.0072**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW45	Notch-V1	Notch-V2	PW2	SW13
				Sampling date / time	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-001	EB2339753-002	EB2339753-003	EB2339753-004	EB2339753-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		**0.0090**	<0.0005	<0.0005	**0.0016**	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0010	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.002**	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	SW45	Notch-V1	Notch-V2	PW2	SW13
				Sampling date / time	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-001	EB2339753-002	EB2339753-003	EB2339753-004	EB2339753-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.321**	**0.0810**	**0.100**	**0.0931**	**0.311**
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**1.12**	**0.0958**	**0.122**	**0.105**	**0.379**
^ **Sum of PFAS**	----	0.0002	µg/L		**1.18**	**0.101**	**0.130**	**0.107**	**0.401**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**91.1**	**135**	**97.5**	**104**	**86.7**
13C8-PFOA	----	0.0005	%		**121**	**114**	**114**	**116**	**105**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	DRD	SW22	SW12	SW41	SW20
			Sampling date / time	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	08-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-006	EB2339753-007	EB2339753-008	EB2339753-009	EB2339753-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.98	8.11	8.32	8.10	8.21
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	4530	2600	4410	3350	497
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	3750	1730	2540	3300	320
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	47	86	9	17	420
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	11	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	97	66	291	176	159
Total Alkalinity as CaCO3	----	1	mg/L	97	66	302	176	159
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	940	146	542	46	7
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	898	746	953	925	58
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	296	170	89	190	36
Magnesium	7439-95-4	1	mg/L	166	113	151	109	18
Sodium	7440-23-5	1	mg/L	454	163	571	257	43
Potassium	7440-09-7	1	mg/L	25	22	2	7	4
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.992	1.10	0.205	0.311	0.438
Iron	7439-89-6	0.05	mg/L	0.88	3.82	0.16	0.15	4.04
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.2	0.2	0.4	0.2	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.47	0.03	<0.01	<0.01	0.03

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	DRD	SW22	SW12	SW41	SW20
			Sampling date / time	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	08-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-006	EB2339753-007	EB2339753-008	EB2339753-009	EB2339753-010
				Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	**0.03**	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.42**	<0.01	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.45**	<0.01	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.13**	**0.01**	<0.01	<0.01	<0.01
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**46.8**	**25.4**	**44.2**	**30.6**	**4.96**
ø Total Cations	----	0.01	meq/L	**48.8**	**25.4**	**41.8**	**29.8**	**5.25**
ø Ionic Balance	----	0.01	%	**2.07**	**0.07**	**2.84**	**1.25**	**2.86**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0170	<0.0185	<0.0115	**0.0022**	<0.0016
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0020	<0.0015	**0.0086**	<0.0015	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	**0.0074**	**0.0187**	**0.0594**	**0.0109**	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	**0.0019**	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.0289**	**0.0149**	**0.0181**	**0.0152**	<0.0006
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.0100	<0.0080	<0.0080	<0.0080	<0.0081
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0100	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	**0.0018**	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DRD	SW22	SW12	SW41	SW20
				Sampling date / time	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	08-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-006	EB2339753-007	EB2339753-008	EB2339753-009	EB2339753-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DRD	SW22	SW12	SW41	SW20
				Sampling date / time	05-Dec-2023 00:00	05-Dec-2023 00:00	05-Dec-2023 00:00	08-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-006	EB2339753-007	EB2339753-008	EB2339753-009	EB2339753-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.0363**	**0.0336**	**0.0775**	**0.0261**	<0.0005
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.0381**	**0.0336**	**0.0775**	**0.0283**	<0.0005
^ **Sum of PFAS**	----	0.0002	µg/L		**0.0381**	**0.0336**	**0.0880**	**0.0283**	<0.0005
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**114**	**95.8**	**99.0**	**109**	**130**
13C8-PFOA	----	0.0005	%		**121**	**116**	**113**	**110**	**117**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	ESC3	ESC4	L005-B01	L006-B05	L012-B01
			Sampling date / time	06-Dec-2023 00:00	07-Dec-2023 00:00	12-Dec-2023 00:00	08-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-011	EB2339753-012	EB2339753-013	EB2339753-014	EB2339753-015
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.78	7.69	7.85	7.42	7.54
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	10600	10600	2180	3240	1380
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	8270	8820	1470	2340	1050
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	2	5	<1	66	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	256	200	325	147	179
Total Alkalinity as CaCO3	----	1	mg/L	256	200	325	147	179
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1690	1830	63	107	86
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2640	2600	516	910	299
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	379	515	93	239	94
Magnesium	7439-95-4	1	mg/L	530	544	62	135	52
Sodium	7440-23-5	1	mg/L	1220	892	251	161	101
Potassium	7440-09-7	1	mg/L	2	<1	3	2	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	6.01	0.601	0.001	0.006	0.009
Iron	7439-89-6	0.05	mg/L	<0.05	0.07	<0.05	15.4	<0.05
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.3	0.7	0.2	0.1	0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.19	<0.01	<0.01	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	ESC3	ESC4	L005-B01	L006-B05	L012-B01
				Sampling date / time	06-Dec-2023 00:00	07-Dec-2023 00:00	12-Dec-2023 00:00	08-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-011	EB2339753-012	EB2339753-013	EB2339753-014	EB2339753-015
					Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	**1.65**	**3.24**	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	**1.65**	**3.24**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.02**	<0.01	**0.02**	<0.01	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**115**	**115**	**22.4**	**30.8**	**13.8**
ø Total Cations	----	0.01	meq/L		**116**	**109**	**20.7**	**30.1**	**13.4**
ø Ionic Balance	----	0.01	%		**0.38**	**2.74**	**3.76**	**1.22**	**1.42**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0169**	**0.0287**	**0.0029**	**0.0044**	**0.0011**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0088**	**0.0244**	**0.0022**	**0.0036**	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0451**	**0.135**	**0.0218**	**0.0314**	**0.0050**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0013**	**0.0052**	<0.0010	**0.0008**	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0288**	**0.0544**	**0.0674**	**0.0478**	**0.0084**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0079	<0.0080	<0.0020	<0.0081	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	**0.0008**	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	ESC3	ESC4	L005-B01	L006-B05	L012-B01
				Sampling date / time	06-Dec-2023 00:00	07-Dec-2023 00:00	12-Dec-2023 00:00	08-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-011	EB2339753-012	EB2339753-013	EB2339753-014	EB2339753-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		**0.0006**	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	ESC3	ESC4	L005-B01	L006-B05	L012-B01
				Sampling date / time	06-Dec-2023 00:00	07-Dec-2023 00:00	12-Dec-2023 00:00	08-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-011	EB2339753-012	EB2339753-013	EB2339753-014	EB2339753-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.0739**	**0.189**	**0.0892**	**0.0792**	**0.0134**
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.0908**	**0.218**	**0.0929**	**0.0836**	**0.0145**
^ **Sum of PFAS**	----	0.0002	µg/L		**0.102**	**0.248**	**0.0951**	**0.0880**	**0.0145**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**89.3**	**100**	**83.4**	**92.5**	**111**
13C8-PFOA	----	0.0005	%		**102**	**113**	**112**	**113**	**110**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	L021-B01	MW09	MW31	MW32	MW33
			Sampling date / time	08-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	12-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-016	EB2339753-017	EB2339753-018	EB2339753-019	EB2339753-020
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.53	7.80	7.87	7.43	7.54
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	690	12300	5290	6900	5390
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	485	8620	3760	6740	5300
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	198	3	<1	5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	130	453	574	465	136
Total Alkalinity as CaCO3	----	1	mg/L	130	453	574	465	136
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	10	1760	21	972	56
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	136	3120	1320	1640	1520
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	45	221	59	445	351
Magnesium	7439-95-4	1	mg/L	22	516	284	506	42
Sodium	7440-23-5	1	mg/L	64	1750	510	291	584
Potassium	7440-09-7	1	mg/L	1	<1	<1	<1	2
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	<0.001	0.424	0.232	0.776	2.01
Iron	7439-89-6	0.05	mg/L	<0.05	3.68	0.07	0.09	0.36
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.1	0.8	0.8	0.6	0.4
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.01	<0.01	0.64

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	L021-B01	MW09	MW31	MW32	MW33
			Sampling date / time	08-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	12-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-016	EB2339753-017	EB2339753-018	EB2339753-019	EB2339753-020
				Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.48**	<0.01	**0.06**	<0.01	**0.01**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.48**	<0.01	**0.06**	<0.01	**0.01**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.02**	**0.03**	**0.04**	<0.01	<0.01
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**6.64**	**134**	**49.1**	**75.8**	**46.8**
ø Total Cations	----	0.01	meq/L	**6.86**	**130**	**48.5**	**76.5**	**46.4**
ø Ionic Balance	----	0.01	%	**1.66**	**1.55**	**0.65**	**0.47**	**0.36**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	**0.0013**	**0.0166**	<0.0016	**0.816**	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	**0.0012**	**0.0070**	<0.0005	**0.763**	**0.0018**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	**0.0121**	**0.0392**	<0.0010	**5.00**	**0.0315**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0015	<0.0005	**0.159**	<0.0015
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.0501**	**0.0476**	<0.0006	**1.59**	**0.0246**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	<0.0005	<0.0032	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.0020	<0.0082	<0.0080	**0.232**	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	<0.0016	<0.0005	**0.368**	**0.0008**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	<0.0005	<0.0005	**0.200**	**0.0011**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	<0.0005	<0.0005	**1.08**	**0.0042**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	<0.0005	<0.0005	**0.268**	**0.0010**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L021-B01	MW09	MW31	MW32	MW33
				Sampling date / time	08-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	12-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-016	EB2339753-017	EB2339753-018	EB2339753-019	EB2339753-020
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	**0.0007**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0080	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.008	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.008	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.008	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.008	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0032	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.003	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.003	**0.028**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.003	<0.002

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	L021-B01	MW09	MW31	MW32	MW33
				Sampling date / time	08-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	12-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-016	EB2339753-017	EB2339753-018	EB2339753-019	EB2339753-020
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.003	<0.002
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.0622**	**0.0868**	<0.0006	**6.59**	**0.0561**
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.0635**	**0.103**	<0.0005	**9.55**	**0.0912**
^ **Sum of PFAS**	----	0.0002	µg/L		**0.0647**	**0.110**	<0.0005	**10.5**	**0.0937**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**93.3**	**107**	**116**	**116**	**107**
13C8-PFOA	----	0.0005	%		**115**	**108**	**111**	**116**	**101**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW40	MW42	MW43	MW49	MW56
			Sampling date / time	06-Dec-2023 00:00	07-Dec-2023 00:00	08-Dec-2023 00:00	06-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-021	EB2339753-022	EB2339753-023	EB2339753-024	EB2339753-025
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.72	7.82	7.77	7.78	8.05
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	8670	11300	7890	15600	11200
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	6760	8420	7840	10900	7850
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	38	3	10	8	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	659	337	476	660	643
Total Alkalinity as CaCO3	----	1	mg/L	659	337	476	660	643
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	677	1580	1190	786	732
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2420	2910	1740	4400	3110
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	148	274	288	286	200
Magnesium	7439-95-4	1	mg/L	490	499	634	554	424
Sodium	7440-23-5	1	mg/L	965	1480	402	1890	1420
Potassium	7440-09-7	1	mg/L	<1	1	1	3	<1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.550	4.36	0.153	1.94	0.002
Iron	7439-89-6	0.05	mg/L	1.52	0.12	0.72	2.18	<0.05
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.6	1.5	0.4	0.5	0.3
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.03	0.02	0.02	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW40	MW42	MW43	MW49	MW56
				Sampling date / time	06-Dec-2023 00:00	07-Dec-2023 00:00	08-Dec-2023 00:00	06-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-021	EB2339753-022	EB2339753-023	EB2339753-024	EB2339753-025
					Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.09**	<0.01	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.09**	<0.01	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.03**	**0.02**	<0.01	<0.01	**0.03**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**95.5**	**122**	**83.4**	**154**	**116**
ø Total Cations	----	0.01	meq/L		**89.7**	**119**	**84.1**	**142**	**107**
ø Ionic Balance	----	0.01	%		**3.15**	**1.07**	**0.41**	**3.89**	**4.12**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0478**	**0.0166**	**0.232**	**0.107**	**0.0557**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0273**	**0.0079**	**0.223**	**0.136**	**0.0332**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.188**	**0.0420**	**1.15**	**1.39**	**0.256**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0094**	<0.0015	**0.0242**	**0.0216**	**0.0162**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.349**	**0.0330**	**0.104**	**0.455**	**0.711**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0080	<0.0079	**0.125**	**0.0315**	<0.0079
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0016	**0.0761**	**0.0045**	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	**0.0329**	**0.0026**	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	**0.287**	**0.0190**	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	**0.0312**	**0.0026**	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW40	MW42	MW43	MW49	MW56
				Sampling date / time	06-Dec-2023 00:00	07-Dec-2023 00:00	08-Dec-2023 00:00	06-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-021	EB2339753-022	EB2339753-023	EB2339753-024	EB2339753-025
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0040	<0.0040	<0.0005	<0.0040
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.004	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.004	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.004	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	**0.006**	**0.024**	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW40	MW42	MW43	MW49	MW56
				Sampling date / time	06-Dec-2023 00:00	07-Dec-2023 00:00	08-Dec-2023 00:00	06-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-021	EB2339753-022	EB2339753-023	EB2339753-024	EB2339753-025
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.537**	**0.0750**	**1.25**	**1.84**	**0.967**
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.585**	**0.0916**	**2.04**	**2.04**	**1.02**
^ **Sum of PFAS**	----	0.0002	µg/L		**0.622**	**0.0995**	**2.29**	**2.19**	**1.07**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**108**	**113**	**83.7**	**109**	**104**
13C8-PFOA	----	0.0005	%		**107**	**116**	**82.4**	**104**	**112**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW59	MW68	MW69	MW70	MW72
			Sampling date / time	07-Dec-2023 00:00	11-Dec-2023 00:00	12-Dec-2023 00:00	12-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-026	EB2339753-027	EB2339753-028	EB2339753-029	EB2339753-030
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.29	7.78	7.66	7.59	7.73
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	12400	9400	1260	950	807
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	6920	6750	977	652	514
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	128	36	10	5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	14	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	811	644	200	186	154
Total Alkalinity as CaCO3	----	1	mg/L	825	644	200	186	154
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	688	750	82	57	47
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	3240	2580	265	174	138
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	8	165	96	63	54
Magnesium	7439-95-4	1	mg/L	270	391	46	31	28
Sodium	7440-23-5	1	mg/L	1960	1040	88	77	59
Potassium	7440-09-7	1	mg/L	<1	<1	2	2	4
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	0.003	0.424	0.075	0.421	0.360
Iron	7439-89-6	0.05	mg/L	0.06	4.82	0.81	0.48	0.13
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.7	0.5	<0.1	<0.1	0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.01	<0.01	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW59	MW68	MW69	MW70	MW72
			Sampling date / time	07-Dec-2023 00:00	11-Dec-2023 00:00	12-Dec-2023 00:00	12-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-026	EB2339753-027	EB2339753-028	EB2339753-029	EB2339753-030
				Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.63**	<0.01	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.63**	<0.01	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	**0.04**	**0.01**	<0.01	**0.01**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**122**	**101**	**13.2**	**9.81**	**7.95**
ø Total Cations	----	0.01	meq/L	**108**	**85.6**	**12.4**	**9.10**	**7.67**
ø Ionic Balance	----	0.01	%	**6.23**	**8.35**	**2.82**	**3.78**	**1.80**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	**0.0386**	**0.0455**	**0.0018**	**0.0014**	<0.0010
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	**0.0301**	**0.0310**	**0.0016**	**0.0010**	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	**0.251**	**0.223**	**0.0143**	**0.0109**	**0.0036**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	**0.0103**	**0.0082**	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.104**	**0.339**	**0.0311**	**0.0493**	**0.0066**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	**0.0493**	<0.0081	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	**0.0098**	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	**0.0058**	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	**0.0439**	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	**0.0097**	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW59	MW68	MW69	MW70	MW72
				Sampling date / time	07-Dec-2023 00:00	11-Dec-2023 00:00	12-Dec-2023 00:00	12-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-026	EB2339753-027	EB2339753-028	EB2339753-029	EB2339753-030
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0040	<0.0040	<0.0040	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0016	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		**0.002**	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW59	MW68	MW69	MW70	MW72
				Sampling date / time	07-Dec-2023 00:00	11-Dec-2023 00:00	12-Dec-2023 00:00	12-Dec-2023 00:00	11-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-026	EB2339753-027	EB2339753-028	EB2339753-029	EB2339753-030
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.355**	**0.562**	**0.0454**	**0.0602**	**0.0102**
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.514**	**0.608**	**0.0472**	**0.0616**	**0.0102**
^ **Sum of PFAS**	----	0.0002	µg/L		**0.554**	**0.647**	**0.0488**	**0.0626**	**0.0102**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**81.8**	**107**	**107**	**96.7**	**83.2**
13C8-PFOA	----	0.0005	%		**81.8**	**104**	**113**	**91.8**	**86.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW73	MW74	MW78	MW80	MW81
				Sampling date / time	09-Dec-2023 00:00	07-Dec-2023 00:00	06-Dec-2023 00:00	11-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-031	EB2339753-032	EB2339753-033	EB2339753-034	EB2339753-035
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.39	7.99	8.09	7.77	7.97
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		2670	4270	12400	5370	7270
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		2520	2750	7560	3870	5800
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L		22	8	1	31	<1
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		219	929	604	295	420
Total Alkalinity as CaCO3	----	1	mg/L		219	929	604	295	420
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		130	589	1660	657	1200
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		712	615	2810	1260	1530
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		197	96	107	158	257
Magnesium	7439-95-4	1	mg/L		108	118	316	196	607
Sodium	7440-23-5	1	mg/L		136	735	2180	610	438
Potassium	7440-09-7	1	mg/L		4	8	2	5	<1
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		0.096	0.047	0.078	4.50	0.048
Iron	7439-89-6	0.05	mg/L		1.01	1.12	<0.05	5.70	0.30
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		<0.1	1.0	1.1	0.2	0.5
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	0.05	<0.01	0.52	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW73	MW74	MW78	MW80	MW81
			Sampling date / time	09-Dec-2023 00:00	07-Dec-2023 00:00	06-Dec-2023 00:00	11-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-031	EB2339753-032	EB2339753-033	EB2339753-034	EB2339753-035
				Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	**0.01**	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	**0.01**	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	**0.01**	<0.01	<0.01
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**27.2**	**48.2**	**126**	**55.1**	**76.5**
ø Total Cations	----	0.01	meq/L	**24.7**	**46.7**	**126**	**50.7**	**81.8**
ø Ionic Balance	----	0.01	%	**4.68**	**1.58**	**0.13**	**4.20**	**3.35**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	**0.0059**	**0.146**	**0.0137**	**0.0116**	**0.0124**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	**0.0058**	**0.0764**	**0.0064**	**0.0089**	**0.0099**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	**0.0562**	**0.300**	**0.0380**	**0.0590**	**0.0856**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	**0.0014**	**0.0036**	<0.0010	<0.0010	**0.0028**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.0984**	**0.0240**	**0.0277**	**0.0106**	**0.0444**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.0020	**0.567**	<0.0080	<0.0080	<0.0079
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	**1.17**	<0.0016	<0.0016	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	**0.139**	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	**0.539**	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	**0.0141**	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW73	MW74	MW78	MW80	MW81
				Sampling date / time	09-Dec-2023 00:00	07-Dec-2023 00:00	06-Dec-2023 00:00	11-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-031	EB2339753-032	EB2339753-033	EB2339753-034	EB2339753-035
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0005	<0.0040	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	**0.007**	<0.001	<0.002	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW73	MW74	MW78	MW80	MW81
				Sampling date / time	09-Dec-2023 00:00	07-Dec-2023 00:00	06-Dec-2023 00:00	11-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-031	EB2339753-032	EB2339753-033	EB2339753-034	EB2339753-035
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.155**	**0.324**	**0.0657**	**0.0696**	**0.130**
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.160**	**2.91**	**0.0794**	**0.0812**	**0.142**
^ **Sum of PFAS**	----	0.0002	µg/L		**0.168**	**2.99**	**0.0858**	**0.0901**	**0.155**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**119**	**132**	**91.4**	**113**	**101**
13C8-PFOA	----	0.0005	%		**116**	**122**	**90.0**	**111**	**100**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW82	MW83	MW84	MW85	MW89
			Sampling date / time	06-Dec-2023 00:00	06-Dec-2023 00:00	06-Dec-2023 00:00	06-Dec-2023 00:00	08-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-036	EB2339753-037	EB2339753-038	EB2339753-039	EB2339753-040
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.80	7.84	7.77	12.0	7.74
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	11400	8650	6270	9300	7780
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	9600	7020	4830	6020	6680
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	12	<1	12	617
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	712	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	37	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	166	322	494	<1	409
Total Alkalinity as CaCO3	----	1	mg/L	166	322	494	749	409
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2180	1440	878	313	1320
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	2710	1990	1470	1640	1750
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	538	358	271	892	299
Magnesium	7439-95-4	1	mg/L	585	418	497	<1	558
Sodium	7440-23-5	1	mg/L	1100	950	332	712	532
Potassium	7440-09-7	1	mg/L	3	<1	<1	34	<1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	9.66	2.10	0.012	0.003	0.527
Iron	7439-89-6	0.05	mg/L	0.14	0.59	<0.05	0.12	5.78
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	1.5	0.9	0.6	0.8	0.5
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.17	0.13	<0.01	0.40	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW82	MW83	MW84	MW85	MW89
			Sampling date / time	06-Dec-2023 00:00	06-Dec-2023 00:00	06-Dec-2023 00:00	06-Dec-2023 00:00	08-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-036	EB2339753-037	EB2339753-038	EB2339753-039	EB2339753-040
				Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**0.19**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	**0.19**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**125**	**92.6**	**69.6**	**67.7**	**85.0**
ø Total Cations	----	0.01	meq/L	**123**	**93.6**	**68.9**	**76.4**	**84.0**
ø Ionic Balance	----	0.01	%	**0.90**	**0.56**	**0.54**	**5.97**	**0.61**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	**0.0136**	**0.0126**	**1.93**	**0.0614**	**0.102**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	**0.0059**	**0.0087**	**2.63**	**0.0590**	**0.0830**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	**0.0387**	**0.0669**	**13.5**	**0.335**	**0.612**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0010	**0.0020**	**0.694**	**0.0116**	**0.0204**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.0175**	**0.0661**	**10.2**	**0.162**	**0.140**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	<0.0079	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.0080	<0.0079	**0.658**	**0.0273**	**0.0500**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0016	<0.0016	**0.938**	<0.0016	**0.0204**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0010	<0.0005	**0.542**	<0.0015	**0.0111**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	<0.0005	**4.74**	<0.0015	**0.0467**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	<0.0005	**0.917**	**0.0088**	**0.0233**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82	MW83	MW84	MW85	MW89
				Sampling date / time	06-Dec-2023 00:00	06-Dec-2023 00:00	06-Dec-2023 00:00	06-Dec-2023 00:00	08-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-036	EB2339753-037	EB2339753-038	EB2339753-039	EB2339753-040
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0079	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0079	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0079	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0005	<0.0079	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0005	<0.0079	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0040	<0.0198	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0079	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.020	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.020	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.020	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.020	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0079	<0.0016	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0079	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.008	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.008	<0.003	**0.002**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.008	<0.002	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82	MW83	MW84	MW85	MW89
				Sampling date / time	06-Dec-2023 00:00	06-Dec-2023 00:00	06-Dec-2023 00:00	06-Dec-2023 00:00	08-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-036	EB2339753-037	EB2339753-038	EB2339753-039	EB2339753-040
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.008	<0.002	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.0562**	**0.133**	**23.7**	**0.497**	**0.752**
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.0698**	**0.146**	**33.4**	**0.594**	**1.01**
^ **Sum of PFAS**	----	0.0002	µg/L		**0.0757**	**0.156**	**36.7**	**0.665**	**1.11**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**80.1**	**132**	**103**	**123**	**105**
13C8-PFOA	----	0.0005	%		**83.6**	**121**	**110**	**110**	**114**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90	MW91	MW94	MW98	RN13030126
				Sampling date / time	07-Dec-2023 00:00	08-Dec-2023 00:00	06-Dec-2023 00:00	07-Dec-2023 00:00	09-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-041	EB2339753-042	EB2339753-043	EB2339753-044	EB2339753-045
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.79	7.95	8.12	8.40	7.88
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		8860	3220	12300	8500	633
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		7850	2360	7670	5000	445
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L		3	7	<1	72	<1
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	37	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		319	652	609	916	142
Total Alkalinity as CaCO3	----	1	mg/L		319	652	609	953	142
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		1560	187	1650	102	18
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		2200	665	2790	2150	108
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		315	120	105	28	42
Magnesium	7439-95-4	1	mg/L		606	195	304	90	20
Sodium	7440-23-5	1	mg/L		810	296	2120	1700	58
Potassium	7440-09-7	1	mg/L		<1	<1	2	3	2
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		0.098	0.016	0.078	0.126	0.001
Iron	7439-89-6	0.05	mg/L		0.41	0.09	<0.05	1.98	<0.05
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.6	0.7	1.1	2.5	0.1
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	<0.01	<0.01	0.03	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW90	MW91	MW94	MW98	RN13030126
			Sampling date / time	07-Dec-2023 00:00	08-Dec-2023 00:00	06-Dec-2023 00:00	07-Dec-2023 00:00	09-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-041	EB2339753-042	EB2339753-043	EB2339753-044	EB2339753-045
				Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	**0.01**	<0.01	**0.08**	**0.06**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	**0.01**	<0.01	**0.08**	**0.06**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.01**	<0.01	**0.02**	**0.02**	**0.02**
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**101**	**35.7**	**125**	**81.8**	**6.26**
ø Total Cations	----	0.01	meq/L	**101**	**34.9**	**122**	**82.8**	**6.32**
ø Ionic Balance	----	0.01	%	**0.04**	**1.08**	**1.09**	**0.62**	**0.46**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	**0.0199**	**0.108**	**0.0244**	<0.0195	**0.0007**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	**0.0126**	**0.110**	**0.0078**	**0.0075**	<0.0010
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	**0.0889**	**0.594**	**0.0398**	**0.0798**	**0.0048**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0040	**0.0189**	<0.0015	**0.0022**	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.0615**	**0.0932**	**0.0380**	**0.0535**	**0.0060**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.0078	**0.0552**	<0.0079	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0016	**0.0297**	<0.0016	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	**0.0174**	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	**0.0750**	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	**0.0274**	<0.0005	**0.0008**	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90	MW91	MW94	MW98	RN13030126
				Sampling date / time	07-Dec-2023 00:00	08-Dec-2023 00:00	06-Dec-2023 00:00	07-Dec-2023 00:00	09-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-041	EB2339753-042	EB2339753-043	EB2339753-044	EB2339753-045
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	**0.001**	<0.001	**0.002**	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90	MW91	MW94	MW98	RN13030126
				Sampling date / time	07-Dec-2023 00:00	08-Dec-2023 00:00	06-Dec-2023 00:00	07-Dec-2023 00:00	09-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-041	EB2339753-042	EB2339753-043	EB2339753-044	EB2339753-045
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.002	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.150**	**0.687**	**0.0778**	**0.133**	**0.0108**
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.170**	**1.00**	**0.102**	**0.136**	**0.0115**
^ **Sum of PFAS**	----	0.0002	µg/L		**0.183**	**1.13**	**0.110**	**0.146**	**0.0115**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**80.4**	**118**	**98.5**	**85.1**	**93.9**
13C8-PFOA	----	0.0005	%		**94.8**	**122**	**119**	**109**	**101**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	RN13030692	RN13030697	RN13030698	RN13030715	FB01_0512
			Sampling date / time	08-Dec-2023 00:00	09-Dec-2023 00:00	09-Dec-2023 00:00	09-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-046	EB2339753-047	EB2339753-048	EB2339753-049	EB2339753-050
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.70	7.72	7.74	8.02	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	547	1270	2870	3200	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	306	845	2000	2430	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	<1	2730	<1	2	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	142	243	290	292	----
Total Alkalinity as CaCO3	----	1	mg/L	142	243	290	292	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	19	25	49	379	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	74	256	730	813	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	35	89	190	164	----
Magnesium	7439-95-4	1	mg/L	17	25	101	105	----
Sodium	7440-23-5	1	mg/L	55	124	219	305	----
Potassium	7440-09-7	1	mg/L	1	6	2	1	----
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	<0.001	7.85	<0.001	0.003	----
Iron	7439-89-6	0.05	mg/L	<0.05	34.4	<0.05	0.10	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.1	0.2	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.01	<0.01	<0.01	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	RN13030692	RN13030697	RN13030698	RN13030715	FB01_0512
			Sampling date / time	08-Dec-2023 00:00	09-Dec-2023 00:00	09-Dec-2023 00:00	09-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-046	EB2339753-047	EB2339753-048	EB2339753-049	EB2339753-050
				Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	**0.96**	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.08**	**0.13**	**11.0**	**4.89**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.08**	**1.09**	**11.0**	**4.89**	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.02**	**0.17**	**0.03**	**0.09**	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**5.32**	**12.6**	**27.4**	**36.6**	----
ø Total Cations	----	0.01	meq/L	**5.56**	**12.0**	**27.4**	**30.1**	----
ø Ionic Balance	----	0.01	%	**2.24**	**2.24**	**0.06**	**9.80**	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	<0.0130	**0.0029**	**0.0012**	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	**0.0091**	**0.0020**	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	**0.0046**	**0.0801**	**0.0211**	**0.0016**	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0035	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.0189**	**0.0831**	**0.0029**	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	**0.0066**	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	**0.0026**	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	**0.0006**	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030692	RN13030697	RN13030698	RN13030715	FB01_0512
				Sampling date / time	08-Dec-2023 00:00	09-Dec-2023 00:00	09-Dec-2023 00:00	09-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-046	EB2339753-047	EB2339753-048	EB2339753-049	EB2339753-050
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.007	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RN13030692	RN13030697	RN13030698	RN13030715	FB01_0512
				Sampling date / time	08-Dec-2023 00:00	09-Dec-2023 00:00	09-Dec-2023 00:00	09-Dec-2023 00:00	05-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-046	EB2339753-047	EB2339753-048	EB2339753-049	EB2339753-050
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.0235**	**0.163**	**0.0240**	**0.0016**	<0.0002
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.0235**	**0.173**	**0.0269**	**0.0028**	<0.0002
^ **Sum of PFAS**	----	0.0002	µg/L		**0.0235**	**0.182**	**0.0289**	**0.0028**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**111**	**131**	**74.0**	**99.7**	**99.6**
13C8-PFOA	----	0.0005	%		**110**	**120**	**94.7**	**106**	**112**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB01_0712	FB01_0912	FB01_1112	RB01_0612	RB01_0712
				Sampling date / time	07-Dec-2023 00:00	09-Dec-2023 00:00	11-Dec-2023 00:00	06-Dec-2023 00:00	07-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-051	EB2339753-052	EB2339753-053	EB2339753-054	EB2339753-055
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FB01_0712	FB01_0912	FB01_1112	RB01_0612	RB01_0712
				Sampling date / time	07-Dec-2023 00:00	09-Dec-2023 00:00	11-Dec-2023 00:00	06-Dec-2023 00:00	07-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-051	EB2339753-052	EB2339753-053	EB2339753-054	EB2339753-055
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**118**	**80.5**	**105**	**120**	**91.8**
13C8-PFOA	----	0.0005	%		**119**	**94.4**	**132**	**115**	**85.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	RB01_0912	RB01_1112	BD01_0812	BD02_0812	BD03_0912
			Sampling date / time	09-Dec-2023 00:00	11-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	09-Dec-2023 00:00
Compound	CAS Number	LOR	Unit	EB2339753-056	EB2339753-057	EB2339753-058	EB2339753-059	EB2339753-060
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	----	----	8.08	7.56	8.08
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	5190	3300	3200
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	----	----	3930	3590	2420
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	1	mg/L	----	----	1	28	7
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	----	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	----	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	----	----	575	147	293
Total Alkalinity as CaCO3	----	1	mg/L	----	----	575	147	293
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	----	21	107	68
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	----	----	1330	903	805
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	----	----	109	240	173
Magnesium	7439-95-4	1	mg/L	----	----	271	135	103
Sodium	7440-23-5	1	mg/L	----	----	515	169	293
Potassium	7440-09-7	1	mg/L	----	----	<1	2	1
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	----	----	0.246	0.008	0.005
Iron	7439-89-6	0.05	mg/L	----	----	0.10	22.6	0.20
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	----	----	0.8	0.1	0.2
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	----	----	0.05	<0.10	0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB01_0912	RB01_1112	BD01_0812	BD02_0812	BD03_0912
				Sampling date / time	09-Dec-2023 00:00	11-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	09-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-056	EB2339753-057	EB2339753-058	EB2339753-059	EB2339753-060
					Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		----	----	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		----	----	**0.10**	**3.30**	**4.91**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		----	----	**0.10**	**3.30**	**4.91**
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	----	**0.04**	<0.01	**0.08**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	----	**49.4**	**30.6**	**30.0**
ø Total Cations	----	0.01	meq/L		----	----	**50.1**	**30.5**	**29.9**
ø Ionic Balance	----	0.01	%		----	----	**0.70**	**0.24**	**0.16**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**0.0032**	**0.0007**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**0.0038**	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	**0.0008**	**0.0401**	**0.0020**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	**0.0011**	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0004	**0.0430**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0079	<0.0079	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0016	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB01_0912	RB01_1112	BD01_0812	BD02_0812	BD03_0912
				Sampling date / time	09-Dec-2023 00:00	11-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	09-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-056	EB2339753-057	EB2339753-058	EB2339753-059	EB2339753-060
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0039	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.004	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB01_0912	RB01_1112	BD01_0812	BD02_0812	BD03_0912
				Sampling date / time	09-Dec-2023 00:00	11-Dec-2023 00:00	08-Dec-2023 00:00	08-Dec-2023 00:00	09-Dec-2023 00:00
Compound	CAS Number	LOR	Unit		EB2339753-056	EB2339753-057	EB2339753-058	EB2339753-059	EB2339753-060
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	**0.0008**	**0.0831**	**0.0020**
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		<0.0002	<0.0002	**0.0008**	**0.0863**	**0.0027**
^ **Sum of PFAS**	----	0.0002	µg/L		<0.0002	<0.0002	**0.0008**	**0.0912**	**0.0027**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**122**	**93.9**	**103**	**110**	**96.2**
13C8-PFOA	----	0.0005	%		**115**	**114**	**85.3**	**89.9**	**89.7**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD04_1112	BD05_1212	----	----	----
				Sampling date / time	11-Dec-2023 00:00	12-Dec-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2339753-061	EB2339753-062	--------	--------	--------
					Result	Result	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**8.02**	**7.86**	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**9680**	**1250**	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		**6880**	**998**	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	1	mg/L		**59**	**46**	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**640**	**200**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**640**	**200**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**719**	**73**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**2630**	**258**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**232**	**96**	----	----	----
Magnesium	7439-95-4	1	mg/L		**395**	**47**	----	----	----
Sodium	7440-23-5	1	mg/L		**1240**	**90**	----	----	----
Potassium	7440-09-7	1	mg/L		**1**	**2**	----	----	----
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		**0.343**	**0.077**	----	----	----
Iron	7439-89-6	0.05	mg/L		**1.54**	**1.32**	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.5**	<0.1	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	<0.01	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	BD04_1112	BD05_1212	----	----	----
			Sampling date / time	11-Dec-2023 00:00	12-Dec-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2339753-061	EB2339753-062	--------	--------	--------
				Result	Result	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.04**	**0.02**	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**102**	**12.8**	----	----	----
ø Total Cations	----	0.01	meq/L	**98.0**	**12.6**	----	----	----
ø Ionic Balance	----	0.01	%	**1.95**	**0.66**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	**0.0296**	**0.0014**	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	**0.0258**	**0.0012**	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	**0.143**	**0.0147**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	**0.0125**	<0.0005	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	**0.180**	**0.0265**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.0081	<0.0080	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0016	<0.0005	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	<0.0005	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD04_1112	BD05_1212	----	----	----
				Sampling date / time	11-Dec-2023 00:00	12-Dec-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2339753-061	EB2339753-062	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0040	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BD04_1112	BD05_1212	----	----	----
				Sampling date / time	11-Dec-2023 00:00	12-Dec-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2339753-061	EB2339753-062	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	----	----	----
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		**0.323**	**0.0412**	----	----	----
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		**0.353**	**0.0426**	----	----	----
^ **Sum of PFAS**	----	0.0002	µg/L		**0.391**	**0.0438**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**121**	**94.7**	----	----	----
13C8-PFOA	----	0.0005	%		**111**	**92.1**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2339753**	Page	: 1 of 23
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 19-Dec-2023
Order number	: ----	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: ----	Issue Date	: 11-Jan-2024
Sampler	: DANIEL PAPINCZAK		
Site	: ----		
Quote number	: BN/344/21 V4		
No. of samples received	: 62		
No. of samples analysed	: 62		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kirsty Watson	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 5508653)									
EB2339753-001	SW45	EA005-P: pH Value	----	0.01	pH Unit	9.14	9.18	0.4	0% - 20%
EB2339753-011	ESC3	EA005-P: pH Value	----	0.01	pH Unit	7.78	7.79	0.1	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5508657)									
EB2339753-021	MW40	EA005-P: pH Value	----	0.01	pH Unit	7.72	7.72	0.0	0% - 20%
EB2339753-031	MW73	EA005-P: pH Value	----	0.01	pH Unit	7.39	7.43	0.5	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5508661)									
EB2339753-041	MW90	EA005-P: pH Value	----	0.01	pH Unit	7.79	7.83	0.5	0% - 20%
EB2339753-059	BD02_0812	EA005-P: pH Value	----	0.01	pH Unit	7.56	7.58	0.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5508652)									
EB2339753-001	SW45	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1420	1420	0.6	0% - 20%
EB2339753-011	ESC3	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	10600	11000	4.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5508656)									
EB2339753-021	MW40	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	8670	9030	4.0	0% - 20%
EB2339753-031	MW73	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2670	2640	1.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5508660)									
EB2339753-041	MW90	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	8860	9040	2.1	0% - 20%
EB2339753-059	BD02_0812	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	3300	3270	0.8	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5504035)									
EB2339715-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	903	909	0.7	0% - 20%
EB2339753-005	SW13	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	10800	10500	3.6	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5504038)									
EB2339753-025	MW56	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	7850	7980	1.6	0% - 20%
EB2339753-015	L012-B01	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1050	1030	1.3	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 5504040)									
EB2339753-045	RN13030126	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	445	407	8.9	0% - 20%
EB2339753-035	MW81	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	5800	5930	2.1	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5504036)									
EB2339715-001	Anonymous	EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit
EB2339753-005	SW13	EA025LL: Suspended Solids (SS)	----	1	mg/L	37	35	6.9	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5504037)									
EB2339753-025	MW56	EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit
EB2339753-015	L012-B01	EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	1	0.0	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5504039)									
EB2339753-045	RN13030126	EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit
EB2339753-035	MW81	EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	<1	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5508654)									
EB2339753-001	SW45	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	74	81	8.6	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	249	246	1.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	323	327	1.2	0% - 20%
EB2339753-011	ESC3	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	256	256	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	256	256	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5508659)									
EB2339753-021	MW40	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	659	661	0.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	659	661	0.3	0% - 20%
EB2339753-031	MW73	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	219	218	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	219	218	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5508663)									
EB2339753-041	MW90	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	319	322	0.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	319	322	0.9	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5508663) - continued									
EB2339753-059	BD02_0812	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	147	147	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	147	147	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5513835)									
EB2339753-038	MW84	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	878	884	0.6	0% - 20%
EB2340401-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	577	592	2.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5513900)									
EB2339753-021	MW40	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	677	688	1.6	0% - 20%
EB2339753-010	SW20	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	7	7	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5513901)									
EB2339753-026	MW59	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	688	693	0.6	0% - 20%
EB2339753-048	RN13030698	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	49	49	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5517443)									
EB2339753-005	SW13	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1100	1090	0.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5513839)									
EB2339753-038	MW84	ED045G: Chloride	16887-00-6	1	mg/L	1470	1480	0.6	0% - 20%
EB2340401-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1560	1570	0.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5513898)									
EB2339753-021	MW40	ED045G: Chloride	16887-00-6	1	mg/L	2420	2460	1.6	0% - 20%
EB2339753-010	SW20	ED045G: Chloride	16887-00-6	1	mg/L	58	59	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5513899)									
EB2339753-026	MW59	ED045G: Chloride	16887-00-6	1	mg/L	3240	3270	1.1	0% - 20%
EB2339753-048	RN13030698	ED045G: Chloride	16887-00-6	1	mg/L	730	727	0.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5517442)									
EB2339753-005	SW13	ED045G: Chloride	16887-00-6	1	mg/L	4750	4660	1.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5512987)									
EB2339715-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	80	85	5.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	41	41	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	96	94	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EB2340222-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5512990)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5512990) - continued									
EB2339753-001	SW45	ED093F: Calcium	7440-70-2	1	mg/L	16	15	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	44	42	4.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	243	232	4.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	5	4	0.0	No Limit
EB2339753-010	SW20	ED093F: Calcium	7440-70-2	1	mg/L	36	36	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	18	18	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	43	43	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5512991)									
EB2339753-021	MW40	ED093F: Calcium	7440-70-2	1	mg/L	148	152	2.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	490	494	0.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	965	976	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5512995)									
EB2339753-028	MW69	ED093F: Calcium	7440-70-2	1	mg/L	96	94	1.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	46	46	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	88	88	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EB2339753-038	MW84	ED093F: Calcium	7440-70-2	1	mg/L	271	272	0.4	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	497	496	0.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	332	337	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5512996)									
EB2339753-049	RN13030715	ED093F: Calcium	7440-70-2	1	mg/L	164	176	6.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	105	103	2.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	305	299	1.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1	1	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5507410)									
EB2339031-037	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	1.83	1.82	0.7	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	2.03	2.00	1.4	0% - 20%
EB2339753-007	SW22	EG020A-T: Manganese	7439-96-5	0.001	mg/L	1.10	1.14	3.7	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	3.82	3.62	5.4	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 5507445)									
EB2340008-101	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2339753-037	MW83	EG020A-T: Manganese	7439-96-5	0.001	mg/L	2.10	2.01	4.3	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.59	0.56	6.7	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 5507446)									
EB2339753-060	BD03_0912	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.20	0.13	43.7	No Limit
EB2339753-028	MW69	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.075	0.077	1.8	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.81	0.79	3.3	0% - 50%
EG020T: Total Metals by ICP-MS (QC Lot: 5507456)									
EB2339031-009	Anonymous	EG020A-T: Manganese	7439-96-5	0.001 (0.010) *	mg/L	36.1	40.6	11.6	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05 (0.10)*	mg/L	1930	2180	12.0	0% - 20%
EB2339753-018	MW31	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.232	0.226	2.4	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.07	0.06	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5508655)									
EB2339753-001	SW45	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.1	1.1	0.0	0% - 50%
EB2339753-011	ESC3	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.3	1.3	0.0	0% - 50%
EK040P: Fluoride by PC Titrator (QC Lot: 5508658)									
EB2339753-021	MW40	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.6	0.6	0.0	No Limit
EB2339753-031	MW73	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5508662)									
EB2339753-041	MW90	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.6	0.6	0.0	No Limit
EB2339753-059	BD02_0812	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5513910)									
EB2340712-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.03	0.0	No Limit
EB2340569-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	25.6	25.8	0.9	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5514333)									
EB2340121-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.04	53.3	No Limit
EB2339715-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01 (0.05)*	mg/L	<0.05	<0.05	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5514334)									
EB2339753-007	SW22	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.02	0.0	No Limit
EB2339753-017	MW09	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5514357)									
EB2339753-031	MW73	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2339753-034	MW80	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.52	0.51	2.7	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5514358)									
EB2339753-048	RN13030698	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2340458-007	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5513837)									
EB2339753-038	MW84	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5513837) - continued									
EB2340401-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5513902)									
EB2339753-021	MW40	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2339753-010	SW20	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5513903)									
EB2339753-026	MW59	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2339753-048	RN13030698	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5517444)									
EB2339753-005	SW13	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5513908)									
EB2340712-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.18	0.18	0.0	0% - 50%
EB2340569-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5514336)									
EB2340121-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2339715-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	3.38	3.35	0.9	0% - 20%
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5514337)									
EB2339753-007	SW22	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.01	0.0	No Limit
EB2339753-017	MW09	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5514360)									
EB2339753-031	MW73	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2339753-034	MW80	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5514361)									
EB2339753-048	RN13030698	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	11.0	11.3	2.5	0% - 20%
EB2340458-007	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.47	0.47	0.0	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5513840)									
EB2339753-038	MW84	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2340401-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.02	0.02	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5513895)									
EB2339753-021	MW40	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.03	0.03	0.0	No Limit
EB2339753-010	SW20	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5513896)									
EB2339753-026	MW59	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2339753-048	RN13030698	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.03	0.03	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5517441)									
EB2339753-005	SW13	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5513502)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5513502) - continued									
EB2340308-006	Anonymous	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	<0.0002	0.0	No Limit
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0020	0.0021	5.8	No Limit
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005 (0.0010)*	µg/L	<0.0010	<0.0010	0.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005 (0.0010)*	µg/L	<0.0010	<0.0010	0.0	No Limit
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
EB2340308-008	Anonymous	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	<0.0002	0.0	No Limit
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0017	0.0011	42.7	No Limit
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5513502)									
EB2340308-006	Anonymous	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005 (0.0075)*	µg/L	<0.0075	<0.0075	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005 (0.0016)*	µg/L	0.0107	0.0086	22.6	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005 (0.0016)*	µg/L	0.0040	0.0066	50.1	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0044	0.0043	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005 (0.0020)*	µg/L	<0.0020	<0.0020	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5513502) - continued									
EB2340308-006	Anonymous	EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005 (0.0040)*	µg/L	<0.0041	<0.0040	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002 (0.0260)*	µg/L	<0.0260	<0.0260	0.0	No Limit
EB2340308-008	Anonymous	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005 (0.0016)*	µg/L	0.0067	0.0055	20.5	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005 (0.0016)*	µg/L	0.0053	0.0065	20.4	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005 (0.0016)*	µg/L	0.0023	0.0032	33.5	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0087	0.0066	27.7	0% - 50%
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0010	<0.0005	66.7	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005 (0.0040)*	µg/L	<0.0041	<0.0040	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002 (0.0081)*	µg/L	0.0161	0.0163	1.2	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5513502)									
EB2340308-006	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001 (0.004) *	µg/L	<0.004	<0.004	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001 (0.004) *	µg/L	<0.004	<0.004	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001 (0.004) *	µg/L	<0.004	<0.004	0.0	No Limit
EB2340308-008	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5513502) - continued									
EB2340308-008	Anonymous	EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001 (0.004) *	µg/L	<0.004	<0.004	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001 (0.004) *	µg/L	<0.004	<0.004	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001 (0.004) *	µg/L	<0.004	<0.004	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5513502)									
EB2340308-006	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	0.018	0.021	12.8	0% - 20%
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EB2340308-008	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	0.006	0.006	0.0	No Limit
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5513502)									
EB2340308-006	Anonymous	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	<0.0002	<0.0002	0.0	No Limit
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002 (0.0016)*	µg/L	0.0391	0.0426	8.6	0% - 20%
		EP231X-SUT: Sum of PFAS	----	0.0002 (0.0016)*	µg/L	0.0391	0.0426	8.6	0% - 20%
EB2340308-008	Anonymous	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	<0.0002	<0.0002	0.0	No Limit
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002 (0.0016)*	µg/L	0.0468	0.0452	3.5	0% - 20%
		EP231X-SUT: Sum of PFAS	----	0.0002 (0.0016)*	µg/L	0.0468	0.0452	3.5	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 5508653)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 5508657)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 5508661)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	101	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5508652)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	99.7	90.0	106
				<1	24800 µS/cm	106	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5508656)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	100	90.0	106
				<1	12890 µS/cm	106	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5508660)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	94.5	90.0	106
				<1	24800 µS/cm	106	90.0	106
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5504035)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	103	88.0	112
				<10	2000 mg/L	97.2	80.9	118
				<10	2340 mg/L	101	80.8	119
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5504038)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	107	88.0	112
				<10	2000 mg/L	98.3	80.9	118
				<10	2340 mg/L	99.6	80.8	119
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 5504040)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	104	88.0	112
				<10	2000 mg/L	96.1	80.9	118
				<10	2340 mg/L	104	80.8	119
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5504036)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5504036) - continued								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	103	82.0	120
				<1	987 mg/L	100	85.0	115
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5504037)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	105	82.0	120
				<1	987 mg/L	101	85.0	115
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5504039)								
EA025LL: Suspended Solids (SS)	----	1	mg/L	<1	150 mg/L	103	82.0	120
				<1	987 mg/L	94.5	85.0	115
ED037P: Alkalinity by PC Titrator (QCLot: 5508654)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	100	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5508659)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	113	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5508663)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.3	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5513835)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.8	85.0	118
				<1	100 mg/L	102	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5513900)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	113	85.0	118
				<1	100 mg/L	91.6	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5513901)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.9	85.0	118
				<1	100 mg/L	90.0	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5517443)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	85.0	118
				<1	100 mg/L	94.2	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 5513839)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.0	90.0	115
				<1	1000 mg/L	104	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5513898)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.1	90.0	115
				<1	1000 mg/L	99.9	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5513899)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 5513899) - continued								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.5	90.0	115
				<1	1000 mg/L	99.5	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5517442)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.2	90.0	115
				<1	1000 mg/L	99.5	90.0	115
ED093F: Dissolved Major Cations (QCLot: 5512987)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	113	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.9	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.9	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5512990)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	108	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.5	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5512991)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	111	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.5	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5512995)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100.0	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5512996)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.7	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5507410)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.7	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	105	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5507445)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 5507445) - continued								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.4	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	102	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5507446)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	100	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	118
EG020T: Total Metals by ICP-MS (QCLot: 5507456)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	103	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	100	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 5508655)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	101	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5508658)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	101	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5508662)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	96.9	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5513910)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	105	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5514333)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	98.7	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5514334)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	106	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5514357)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	104	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5514358)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	104	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5513837)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5513902)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5513903)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	100	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5517444)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	98.4	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5513908)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.0	85.7	111

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5514336)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.4	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5514337)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	94.8	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5514360)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.7	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5514361)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.1	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5513840)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	96.6	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5513895)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	96.4	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5513896)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.2	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5517441)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	94.4	81.7	117
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5504796)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	127	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	89.8	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	85.7	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	96.2	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	111	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	117	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5504799)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	120	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	114	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	115	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	88.6	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	130	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	124	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5504801)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	105	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	97.4	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	95.0	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	87.8	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5504801) - continued								
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	120	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	132	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5513502)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	82.9	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	91.5	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	94.1	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	107	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	113	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	115	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5504796)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	87.5	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	92.8	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	78.0	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	114	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	99.6	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	88.0	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	106	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	90.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	110	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	118	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5504799)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	119	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	118	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	126	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	127	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	118	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	99.2	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	116	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	128	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	113	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	106	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	110	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5504801)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5504801) - continued								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	92.9	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	106	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	92.8	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	118	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	97.6	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	106	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	106	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	99.2	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	116	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	120	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	100	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5513502)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	85.3	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	114	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	93.2	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	104	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	84.8	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	124	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	128	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	109	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	84.8	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	89.2	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5504796)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	81.6	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	68.0	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	75.2	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	80.6	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	97.4	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	110	65.0	136

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5504796) - continued								
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	106	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5504799)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	120	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	# 148	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	# 151	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	134	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	130	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	135	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	101	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5504801)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	83.2	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	68.8	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	81.0	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	101	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	101	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	119	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	101	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5513502)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	121	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	104	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	78.4	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	93.8	63.3	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5513502) - continued								
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	98.2	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	126	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	133	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5504796)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	104	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	114	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	136	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	128	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5504799)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	110	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	101	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	137	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	110	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5504801)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	94.1	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	99.8	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	121	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	130	53.1	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5513502)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	# 148	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	122	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	# 143	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	107	53.1	133
EP231P: PFAS Sums (QCLot: 5504796)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5504799)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5504799) - continued								
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5504801)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5513502)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5513835)							
EB2339753-044	MW98	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5513900)							
EB2339753-023	MW43	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5513901)							
EB2339753-004	PW2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5517443)							
EB2339753-015	L012-B01	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5513839)							
EB2339753-044	MW98	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5513898)							
EB2339753-023	MW43						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 5513898) - continued							
EB2339753-023	MW43	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5513899)							
EB2339753-004	PW2	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5517442)							
EB2339753-015	L012-B01	ED045G: Chloride	16887-00-6	400 mg/L	95.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5507410)							
EB2339031-040	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	# Not Determined	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5507445)							
EB2339725-010	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	104	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5507446)							
EB2339753-047	RN13030697	EG020A-T: Manganese	7439-96-5	1 mg/L	# Not Determined	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5507456)							
EB2339031-010	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	96.7	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5508655)							
EB2339753-002	Notch-V1	EK040P: Fluoride	16984-48-8	5 mg/L	75.4	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5508658)							
EB2339753-022	MW42	EK040P: Fluoride	16984-48-8	5 mg/L	80.4	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5508662)							
EB2339753-042	MW91	EK040P: Fluoride	16984-48-8	5 mg/L	90.1	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5513910)							
EB2340712-011	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	117	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5514333)							
EB2340121-006	Anonymous	EK055G: Ammonia as N	7664-41-7	2 mg/L	106	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5514334)							
EB2339753-013	L005-B01	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	108	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5514357)							
EB2339753-022	MW42	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	127	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5514358)							
EB2339753-038	MW84	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	102	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5513837)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5513837) - continued							
EB2339753-044	MW98	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	108	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5513902)							
EB2339753-023	MW43	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	104	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5513903)							
EB2339753-004	PW2	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	123	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5517444)							
EB2339753-015	L012-B01	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	98.3	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5513908)							
EB2340712-011	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	104	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5514336)							
EB2340121-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	101	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5514337)							
EB2339753-013	L005-B01	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	# Not Determined	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5514360)							
EB2339753-022	MW42	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	104	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5514361)							
EB2339753-038	MW84	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	108	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5513840)							
EB2339753-044	MW98	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	104	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5513895)							
EB2339753-023	MW43	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	98.8	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5513896)							
EB2339753-004	PW2	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	116	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5517441)							
EB2339753-015	L012-B01	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	96.3	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5513502)							
EB2340308-007	Anonymous	EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00355 µg/L	97.4	70.0	130
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00376 µg/L	83.0	70.0	130
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00379 µg/L	88.2	70.0	130
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00381 µg/L	82.3	70.0	130
		EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00371 µg/L	128	70.0	130
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00385 µg/L	74.8	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5513502)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5513502) - continued							
EB2340308-007	Anonymous	EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.02 µg/L	91.9	70.0	130
		EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.004 µg/L	87.7	70.0	130
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.004 µg/L	103	70.0	130
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.004 µg/L	72.8	70.0	130
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.004 µg/L	74.0	70.0	130
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.004 µg/L	77.2	70.0	130
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.004 µg/L	73.2	70.0	130
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.004 µg/L	70.8	70.0	130
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.004 µg/L	82.8	70.0	130
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.004 µg/L	96.0	70.0	130
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.01 µg/L	71.9	70.0	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5513502)							
EB2340308-007	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.004 µg/L	70.4	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.01 µg/L	80.0	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.01 µg/L	81.7	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.01 µg/L	81.3	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.01 µg/L	84.2	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.004 µg/L	74.8	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.004 µg/L	80.0	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5513502)							
EB2340308-007	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00374 µg/L	71.0	70.0	130
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0038 µg/L	87.7	70.0	130
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00384 µg/L	100.0	70.0	130
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00386 µg/L	72.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2339753**	Page	: 1 of 39
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Telephone	: +61-7-3243 7222
Project	: BC200153.02	Date Samples Received	: 19-Dec-2023
Site	: ----	Issue Date	: 11-Jan-2024
Sampler	: DANIEL PAPINCZAK	No. of samples received	: 62
Order number	: ----	No. of samples analysed	: 62

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-5504799-002	----	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	148 %	68.0-141%	**Recovery greater than upper control limit**
EP231C: Perfluoroalkyl Sulfonamides	QC-5504799-002	----	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	151 %	57.9-141%	**Recovery greater than upper control limit**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	QC-5513502-002	----	**4:2 Fluorotelomer sulfonic acid (4:2 FTS)**	757124-72-4	148 %	63.0-143%	**Recovery greater than upper control limit**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	QC-5513502-002	----	**8:2 Fluorotelomer sulfonic acid (8:2 FTS)**	39108-34-4	143 %	67.0-138%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2339753--044	MW98	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2339753--023	MW43	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2339753--004	PW2	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2339753--015	L012-B01	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2339753--044	MW98	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2339753--023	MW43	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2339753--004	PW2	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EG020T: Total Metals by ICP-MS	EB2339031--040	Anonymous	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries - Continued							
EG020T: Total Metals by ICP-MS	EB2339753--047	RN13030697	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	EB2339753--013	L005-B01	**Nitrite + Nitrate as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / **Container** / Client Sample ID(s)	*Extraction / Preparation*			*Analysis*		
	Date extracted	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	----	----	----	22-Dec-2023	05-Dec-2023	**17**
Clear Plastic Bottle - Natural						
ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	----	----	----	22-Dec-2023	06-Dec-2023	**16**
Clear Plastic Bottle - Natural						
ESC4, MW42, MW59, MW74, MW90, MW98	----	----	----	22-Dec-2023	07-Dec-2023	**15**
Clear Plastic Bottle - Natural						
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	----	----	----	22-Dec-2023	08-Dec-2023	**14**
Clear Plastic Bottle - Natural						
MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	----	----	----	22-Dec-2023	09-Dec-2023	**13**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
SW20, L012-B01, MW68, MW72, MW80, BD04_1112	----	----	----	22-Dec-2023	11-Dec-2023	**11**
Clear Plastic Bottle - Natural						
L005-B01, MW33, MW69, MW70, BD05_1212	----	----	----	22-Dec-2023	12-Dec-2023	**10**
EA015: Total Dissolved Solids dried at 180 ± 5 °C						
Clear Plastic Bottle - Natural						
SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	----	----	----	19-Dec-2023	12-Dec-2023	**7**
Clear Plastic Bottle - Natural						
ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	----	----	----	19-Dec-2023	13-Dec-2023	**6**
Clear Plastic Bottle - Natural						
ESC4, MW42, MW59, MW74, MW90, MW98	----	----	----	19-Dec-2023	14-Dec-2023	**5**
Clear Plastic Bottle - Natural						
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	----	----	----	19-Dec-2023	15-Dec-2023	**4**
Clear Plastic Bottle - Natural						
MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	----	----	----	19-Dec-2023	16-Dec-2023	**3**
Clear Plastic Bottle - Natural						
SW20, L012-B01, MW68, MW72, MW80, BD04_1112	----	----	----	19-Dec-2023	18-Dec-2023	**1**
EA025: Total Suspended Solids dried at 104 ± 2°C						

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA025: Total Suspended Solids dried at 104 ± 2°C - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	----	----	----	19-Dec-2023	12-Dec-2023	**7**
Clear Plastic Bottle - Natural						
ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	----	----	----	19-Dec-2023	13-Dec-2023	**6**
Clear Plastic Bottle - Natural						
ESC4, MW42, MW59, MW74, MW90, MW98	----	----	----	19-Dec-2023	14-Dec-2023	**5**
Clear Plastic Bottle - Natural						
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	----	----	----	19-Dec-2023	15-Dec-2023	**4**
Clear Plastic Bottle - Natural						
MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	----	----	----	19-Dec-2023	16-Dec-2023	**3**
Clear Plastic Bottle - Natural						
SW20, L012-B01, MW68, MW72, MW80, BD04_1112	----	----	----	19-Dec-2023	18-Dec-2023	**1**
ED037P: Alkalinity by PC Titrator						
Clear Plastic Bottle - Natural						
SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	----	----	----	22-Dec-2023	19-Dec-2023	**3**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED037P: Alkalinity by PC Titrator - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	----	----	----	22-Dec-2023	20-Dec-2023	**2**
Clear Plastic Bottle - Natural						
ESC4, MW42, MW59, MW74, MW90, MW98	----	----	----	22-Dec-2023	21-Dec-2023	**1**
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56	----	----	----	03-Jan-2024	12-Dec-2023	**22**
Clear Plastic Bottle - Natural						
MW81	----	----	----	05-Jan-2024	12-Dec-2023	**24**
Clear Plastic Bottle - Natural						
ESC3, MW40, MW49	----	----	----	03-Jan-2024	13-Dec-2023	**21**
Clear Plastic Bottle - Natural						
MW78, MW82, MW83, MW84, MW85, MW94	----	----	----	05-Jan-2024	13-Dec-2023	**23**
Clear Plastic Bottle - Natural						
ESC4, MW42, MW59	----	----	----	03-Jan-2024	14-Dec-2023	**20**
Clear Plastic Bottle - Natural						
MW74, MW90, MW98	----	----	----	05-Jan-2024	14-Dec-2023	**22**
Clear Plastic Bottle - Natural						
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43	----	----	----	03-Jan-2024	15-Dec-2023	**19**
Clear Plastic Bottle - Natural						
MW89, MW91, RN13030692, BD01_0812, BD02_0812	----	----	----	05-Jan-2024	15-Dec-2023	**21**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	----	----	----	05-Jan-2024	16-Dec-2023	**20**
Clear Plastic Bottle - Natural						
SW20, L012-B01, MW68	----	----	----	03-Jan-2024	18-Dec-2023	**16**
Clear Plastic Bottle - Natural						
MW72, BD04_1112	----	----	----	05-Jan-2024	18-Dec-2023	**18**
Clear Plastic Bottle - Natural						
MW80	----	----	----	28-Dec-2023	18-Dec-2023	**10**
Clear Plastic Bottle - Natural						
L005-B01, MW33	----	----	----	03-Jan-2024	19-Dec-2023	**15**
Clear Plastic Bottle - Natural						
MW69, MW70, BD05_1212	----	----	----	05-Jan-2024	19-Dec-2023	**17**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
SW45, Notch-V1, Notch-V2, PW2, DRD, SW22, SW12	----	----	----	22-Dec-2023	07-Dec-2023	**15**
Clear Plastic Bottle - Natural						
SW13, MW56, MW81	----	----	----	28-Dec-2023	07-Dec-2023	**21**
Clear Plastic Bottle - Natural						
ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	----	----	----	22-Dec-2023	08-Dec-2023	**14**
Clear Plastic Bottle - Natural						
ESC4, MW42, MW59, MW74, MW90, MW98	----	----	----	22-Dec-2023	09-Dec-2023	**13**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK057G: Nitrite as N by Discrete Analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	----	----	----	22-Dec-2023	10-Dec-2023	**12**
Clear Plastic Bottle - Natural						
MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	----	----	----	22-Dec-2023	11-Dec-2023	**11**
Clear Plastic Bottle - Natural						
SW20, MW68, MW72, MW80, BD04_1112	----	----	----	22-Dec-2023	13-Dec-2023	**9**
Clear Plastic Bottle - Natural						
L012-B01	----	----	----	28-Dec-2023	13-Dec-2023	**15**
Clear Plastic Bottle - Natural						
L005-B01, MW33, MW69, MW70, BD05_1212	----	----	----	22-Dec-2023	14-Dec-2023	**8**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
SW45, Notch-V1, Notch-V2, PW2, DRD, SW22, SW12	----	----	----	22-Dec-2023	07-Dec-2023	**15**
Clear Plastic Bottle - Natural						
SW13, MW56, MW81	----	----	----	28-Dec-2023	07-Dec-2023	**21**
Clear Plastic Bottle - Natural						
ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	----	----	----	22-Dec-2023	08-Dec-2023	**14**
Clear Plastic Bottle - Natural						
ESC4, MW42, MW59, MW74, MW90, MW98	----	----	----	22-Dec-2023	09-Dec-2023	**13**

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK071G: Reactive Phosphorus as P by discrete analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	----	----	----	22-Dec-2023	10-Dec-2023	**12**
Clear Plastic Bottle - Natural						
MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	----	----	----	22-Dec-2023	11-Dec-2023	**11**
Clear Plastic Bottle - Natural						
SW20, MW68, MW72, MW80, BD04_1112	----	----	----	22-Dec-2023	13-Dec-2023	**9**
Clear Plastic Bottle - Natural						
L012-B01	----	----	----	28-Dec-2023	13-Dec-2023	**15**
Clear Plastic Bottle - Natural						
L005-B01, MW33, MW69, MW70, BD05_1212	----	----	----	22-Dec-2023	14-Dec-2023	**8**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Analytical Methods	Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	2	75	2.67	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	75	1.33	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	**05-Dec-2023**	**----**	----	----	**22-Dec-2023**	05-Dec-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**22-Dec-2023**	06-Dec-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**22-Dec-2023**	07-Dec-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Dec-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**22-Dec-2023**	09-Dec-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
SW20, L012-B01, MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	11-Dec-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
L005-B01, MW33, MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	----	**22-Dec-2023**	12-Dec-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	**05-Dec-2023**	**----**	----	----	**22-Dec-2023**	02-Jan-2024	✓
Clear Plastic Bottle - Natural (EA010-P) ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**22-Dec-2023**	03-Jan-2024	✓
Clear Plastic Bottle - Natural (EA010-P) ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**22-Dec-2023**	04-Jan-2024	✓
Clear Plastic Bottle - Natural (EA010-P) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**22-Dec-2023**	05-Jan-2024	✓
Clear Plastic Bottle - Natural (EA010-P) MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**22-Dec-2023**	06-Jan-2024	✓
Clear Plastic Bottle - Natural (EA010-P) SW20, L012-B01, MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Jan-2024	✓
Clear Plastic Bottle - Natural (EA010-P) L005-B01, MW33, MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	----	**22-Dec-2023**	09-Jan-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	**05-Dec-2023**	**----**	----	----	**19-Dec-2023**	12-Dec-2023	×
Clear Plastic Bottle - Natural (EA015H) ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**19-Dec-2023**	13-Dec-2023	×
Clear Plastic Bottle - Natural (EA015H) ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**19-Dec-2023**	14-Dec-2023	×
Clear Plastic Bottle - Natural (EA015H) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**19-Dec-2023**	15-Dec-2023	×
Clear Plastic Bottle - Natural (EA015H) MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**19-Dec-2023**	16-Dec-2023	×
Clear Plastic Bottle - Natural (EA015H) SW20, L012-B01, MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**----**	----	----	**19-Dec-2023**	18-Dec-2023	×
Clear Plastic Bottle - Natural (EA015H) L005-B01, MW33, MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	----	**19-Dec-2023**	19-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025LL) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	**05-Dec-2023**	**----**	----	----	**19-Dec-2023**	12-Dec-2023	×
Clear Plastic Bottle - Natural (EA025LL) ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**19-Dec-2023**	13-Dec-2023	×
Clear Plastic Bottle - Natural (EA025LL) ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**19-Dec-2023**	14-Dec-2023	×
Clear Plastic Bottle - Natural (EA025LL) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**19-Dec-2023**	15-Dec-2023	×
Clear Plastic Bottle - Natural (EA025LL) MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**19-Dec-2023**	16-Dec-2023	×
Clear Plastic Bottle - Natural (EA025LL) SW20, L012-B01, MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**----**	----	----	**19-Dec-2023**	18-Dec-2023	×
Clear Plastic Bottle - Natural (EA025LL) L005-B01, MW33, MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	----	**19-Dec-2023**	19-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	**05-Dec-2023**	**----**	----	----	**22-Dec-2023**	19-Dec-2023	×
Clear Plastic Bottle - Natural (ED037-P) ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**22-Dec-2023**	20-Dec-2023	×
Clear Plastic Bottle - Natural (ED037-P) ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**22-Dec-2023**	21-Dec-2023	×
Clear Plastic Bottle - Natural (ED037-P) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**22-Dec-2023**	22-Dec-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**22-Dec-2023**	23-Dec-2023	✓
Clear Plastic Bottle - Natural (ED037-P) SW20, L012-B01, MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	25-Dec-2023	✓
Clear Plastic Bottle - Natural (ED037-P) L005-B01, MW33, MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	----	**22-Dec-2023**	26-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) SW45, Notch-V1, Notch-V2, PW2, DRD, SW22, SW12	**05-Dec-2023**	**----**	----	----	**22-Dec-2023**	02-Jan-2024	✓
Clear Plastic Bottle - Natural (ED041G) SW13, MW56, MW81	**05-Dec-2023**	**----**	----	----	**28-Dec-2023**	02-Jan-2024	✓
Clear Plastic Bottle - Natural (ED041G) ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**22-Dec-2023**	03-Jan-2024	✓
Clear Plastic Bottle - Natural (ED041G) ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**22-Dec-2023**	04-Jan-2024	✓
Clear Plastic Bottle - Natural (ED041G) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**22-Dec-2023**	05-Jan-2024	✓
Clear Plastic Bottle - Natural (ED041G) MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**22-Dec-2023**	06-Jan-2024	✓
Clear Plastic Bottle - Natural (ED041G) SW20, MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Jan-2024	✓
Clear Plastic Bottle - Natural (ED041G) L012-B01	**11-Dec-2023**	**----**	----	----	**28-Dec-2023**	08-Jan-2024	✓
Clear Plastic Bottle - Natural (ED041G) L005-B01, MW33, MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	----	**22-Dec-2023**	09-Jan-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
SW45, Notch-V1, Notch-V2, PW2, DRD, SW22, SW12	**05-Dec-2023**	**----**	----	----	**22-Dec-2023**	02-Jan-2024	✓
Clear Plastic Bottle - Natural (ED045G)							
SW13, MW56, MW81	**05-Dec-2023**	**----**	----	----	**28-Dec-2023**	02-Jan-2024	✓
Clear Plastic Bottle - Natural (ED045G)							
ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**22-Dec-2023**	03-Jan-2024	✓
Clear Plastic Bottle - Natural (ED045G)							
ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**22-Dec-2023**	04-Jan-2024	✓
Clear Plastic Bottle - Natural (ED045G)							
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**22-Dec-2023**	05-Jan-2024	✓
Clear Plastic Bottle - Natural (ED045G)							
MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**22-Dec-2023**	06-Jan-2024	✓
Clear Plastic Bottle - Natural (ED045G)							
SW20, MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Jan-2024	✓
Clear Plastic Bottle - Natural (ED045G)							
L012-B01	**11-Dec-2023**	**----**	----	----	**28-Dec-2023**	08-Jan-2024	✓
Clear Plastic Bottle - Natural (ED045G)							
L005-B01, MW33, MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	----	**22-Dec-2023**	09-Jan-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56	**05-Dec-2023**	**----**	----	----	**03-Jan-2024**	12-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
MW81	**05-Dec-2023**	**----**	----	----	**05-Jan-2024**	12-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
ESC3, MW40, MW49	**06-Dec-2023**	**----**	----	----	**03-Jan-2024**	13-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**05-Jan-2024**	13-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
ESC4, MW42, MW59	**07-Dec-2023**	**----**	----	----	**03-Jan-2024**	14-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**05-Jan-2024**	14-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43	**08-Dec-2023**	**----**	----	----	**03-Jan-2024**	15-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**05-Jan-2024**	15-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**05-Jan-2024**	16-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
SW20, L012-B01, MW68	**11-Dec-2023**	**----**	----	----	**03-Jan-2024**	18-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
MW72, BD04_1112	**11-Dec-2023**	**----**	----	----	**05-Jan-2024**	18-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
MW80	**11-Dec-2023**	**----**	----	----	**28-Dec-2023**	18-Dec-2023	×
Clear Plastic Bottle - Natural (ED093F)							
L005-B01, MW33	**12-Dec-2023**	**----**	----	----	**03-Jan-2024**	19-Dec-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations - Continued							
Clear Plastic Bottle - Natural (ED093F)							
MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	**----**	**05-Jan-2024**	19-Dec-2023	✘

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW56	**05-Dec-2023**	**20-Dec-2023**	02-Jun-2024	✓	**23-Dec-2023**	02-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12	**05-Dec-2023**	**20-Dec-2023**	02-Jun-2024	✓	**28-Dec-2023**	02-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW81	**05-Dec-2023**	**20-Dec-2023**	02-Jun-2024	✓	**30-Dec-2023**	02-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW40, MW49	**06-Dec-2023**	**20-Dec-2023**	03-Jun-2024	✓	**23-Dec-2023**	03-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) ESC3	**06-Dec-2023**	**20-Dec-2023**	03-Jun-2024	✓	**28-Dec-2023**	03-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**20-Dec-2023**	03-Jun-2024	✓	**30-Dec-2023**	03-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW42	**07-Dec-2023**	**20-Dec-2023**	04-Jun-2024	✓	**23-Dec-2023**	04-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) ESC4	**07-Dec-2023**	**20-Dec-2023**	04-Jun-2024	✓	**28-Dec-2023**	04-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW59, MW74, MW90, MW98	**07-Dec-2023**	**20-Dec-2023**	04-Jun-2024	✓	**30-Dec-2023**	04-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) L021-B01, MW09, MW31, MW32, MW43	**08-Dec-2023**	**20-Dec-2023**	05-Jun-2024	✓	**23-Dec-2023**	05-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) SW41, L006-B05	**08-Dec-2023**	**20-Dec-2023**	05-Jun-2024	✓	**28-Dec-2023**	05-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**20-Dec-2023**	05-Jun-2024	✓	**30-Dec-2023**	05-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**20-Dec-2023**	06-Jun-2024	✓	**30-Dec-2023**	06-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) L012-B01	**11-Dec-2023**	**20-Dec-2023**	08-Jun-2024	✓	**23-Dec-2023**	08-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) SW20	**11-Dec-2023**	**20-Dec-2023**	08-Jun-2024	✓	**28-Dec-2023**	08-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS - Continued							
MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**20-Dec-2023**	08-Jun-2024	✓	**30-Dec-2023**	08-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW33	**12-Dec-2023**	**20-Dec-2023**	09-Jun-2024	✓	**23-Dec-2023**	09-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) L005-B01	**12-Dec-2023**	**20-Dec-2023**	09-Jun-2024	✓	**28-Dec-2023**	09-Jun-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW69, MW70, BD05_1212	**12-Dec-2023**	**20-Dec-2023**	09-Jun-2024	✓	**30-Dec-2023**	09-Jun-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	**05-Dec-2023**	**----**	----	----	**22-Dec-2023**	02-Jan-2024	✓
Clear Plastic Bottle - Natural (EK040P)							
ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**22-Dec-2023**	03-Jan-2024	✓
Clear Plastic Bottle - Natural (EK040P)							
ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**22-Dec-2023**	04-Jan-2024	✓
Clear Plastic Bottle - Natural (EK040P)							
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**22-Dec-2023**	05-Jan-2024	✓
Clear Plastic Bottle - Natural (EK040P)							
MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**22-Dec-2023**	06-Jan-2024	✓
Clear Plastic Bottle - Natural (EK040P)							
SW20, L012-B01, MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Jan-2024	✓
Clear Plastic Bottle - Natural (EK040P)							
L005-B01, MW33, MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	----	**22-Dec-2023**	09-Jan-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	**05-Dec-2023**	**----**	----	----	**23-Dec-2023**	02-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**23-Dec-2023**	03-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**23-Dec-2023**	04-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**22-Dec-2023**	05-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692	**08-Dec-2023**	**----**	----	----	**23-Dec-2023**	05-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BD03_0912	**09-Dec-2023**	**----**	----	----	**22-Dec-2023**	06-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW73, RN13030126, RN13030697, RN13030698, RN13030715	**09-Dec-2023**	**----**	----	----	**23-Dec-2023**	06-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BD04_1112	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
SW20, L012-B01, MW68, MW72, MW80	**11-Dec-2023**	**----**	----	----	**23-Dec-2023**	08-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
BD05_1212	**12-Dec-2023**	**----**	----	----	**22-Dec-2023**	09-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
L005-B01, MW33, MW69, MW70	**12-Dec-2023**	**----**	----	----	**23-Dec-2023**	09-Jan-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) SW45, Notch-V1, Notch-V2, PW2, DRD, SW22, SW12	**05-Dec-2023**	**----**	----	----	**22-Dec-2023**	07-Dec-2023	×
Clear Plastic Bottle - Natural (EK057G) SW13, MW56, MW81	**05-Dec-2023**	**----**	----	----	**28-Dec-2023**	07-Dec-2023	×
Clear Plastic Bottle - Natural (EK057G) ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Dec-2023	×
Clear Plastic Bottle - Natural (EK057G) ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**22-Dec-2023**	09-Dec-2023	×
Clear Plastic Bottle - Natural (EK057G) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**22-Dec-2023**	10-Dec-2023	×
Clear Plastic Bottle - Natural (EK057G) MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**22-Dec-2023**	11-Dec-2023	×
Clear Plastic Bottle - Natural (EK057G) SW20, MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	13-Dec-2023	×
Clear Plastic Bottle - Natural (EK057G) L012-B01	**11-Dec-2023**	**----**	----	----	**28-Dec-2023**	13-Dec-2023	×
Clear Plastic Bottle - Natural (EK057G) L005-B01, MW33, MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	----	**22-Dec-2023**	14-Dec-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, MW56, MW81	**05-Dec-2023**	**----**	----	----	**23-Dec-2023**	02-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**23-Dec-2023**	03-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**23-Dec-2023**	04-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**22-Dec-2023**	05-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692	**08-Dec-2023**	**----**	----	----	**23-Dec-2023**	05-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) BD03_0912	**09-Dec-2023**	**----**	----	----	**22-Dec-2023**	06-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW73, RN13030126, RN13030697, RN13030698, RN13030715	**09-Dec-2023**	**----**	----	----	**23-Dec-2023**	06-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) BD04_1112	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) SW20, L012-B01, MW68, MW72, MW80	**11-Dec-2023**	**----**	----	----	**23-Dec-2023**	08-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) BD05_1212	**12-Dec-2023**	**----**	----	----	**22-Dec-2023**	09-Jan-2024	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) L005-B01, MW33, MW69, MW70	**12-Dec-2023**	**----**	----	----	**23-Dec-2023**	09-Jan-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) SW45, Notch-V1, Notch-V2, PW2, DRD, SW22, SW12	**05-Dec-2023**	**----**	----	----	**22-Dec-2023**	07-Dec-2023	×
Clear Plastic Bottle - Natural (EK071G) SW13, MW56, MW81	**05-Dec-2023**	**----**	----	----	**28-Dec-2023**	07-Dec-2023	×
Clear Plastic Bottle - Natural (EK071G) ESC3, MW40, MW49, MW78, MW82, MW83, MW84, MW85, MW94	**06-Dec-2023**	**----**	----	----	**22-Dec-2023**	08-Dec-2023	×
Clear Plastic Bottle - Natural (EK071G) ESC4, MW42, MW59, MW74, MW90, MW98	**07-Dec-2023**	**----**	----	----	**22-Dec-2023**	09-Dec-2023	×
Clear Plastic Bottle - Natural (EK071G) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW43, MW89, MW91, RN13030692, BD01_0812, BD02_0812	**08-Dec-2023**	**----**	----	----	**22-Dec-2023**	10-Dec-2023	×
Clear Plastic Bottle - Natural (EK071G) MW73, RN13030126, RN13030697, RN13030698, RN13030715, BD03_0912	**09-Dec-2023**	**----**	----	----	**22-Dec-2023**	11-Dec-2023	×
Clear Plastic Bottle - Natural (EK071G) SW20, MW68, MW72, MW80, BD04_1112	**11-Dec-2023**	**----**	----	----	**22-Dec-2023**	13-Dec-2023	×
Clear Plastic Bottle - Natural (EK071G) L012-B01	**11-Dec-2023**	**----**	----	----	**28-Dec-2023**	13-Dec-2023	×
Clear Plastic Bottle - Natural (EK071G) L005-B01, MW33, MW69, MW70, BD05_1212	**12-Dec-2023**	**----**	----	----	**22-Dec-2023**	14-Dec-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, FB01_0512	**05-Dec-2023**	**08-Jan-2024**	02-Jun-2024	✓	**09-Jan-2024**	02-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW56, MW81	**05-Dec-2023**	**09-Jan-2024**	02-Jun-2024	✓	**09-Jan-2024**	02-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW85, MW94, RB01_0612	**06-Dec-2023**	**08-Jan-2024**	03-Jun-2024	✓	**09-Jan-2024**	03-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW40, MW49, MW78, MW82, MW83, MW84	**06-Dec-2023**	**09-Jan-2024**	03-Jun-2024	✓	**09-Jan-2024**	03-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW90, MW98, FB01_0712, RB01_0712	**07-Dec-2023**	**08-Jan-2024**	04-Jun-2024	✓	**09-Jan-2024**	04-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW42, MW59, MW74	**07-Dec-2023**	**09-Jan-2024**	04-Jun-2024	✓	**09-Jan-2024**	04-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD01_0812, BD02_0812	**08-Dec-2023**	**04-Jan-2024**	05-Jun-2024	✓	**05-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW89, MW91, RN13030692	**08-Dec-2023**	**08-Jan-2024**	05-Jun-2024	✓	**09-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW43	**08-Dec-2023**	**09-Jan-2024**	05-Jun-2024	✓	**09-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD03_0912	**09-Dec-2023**	**04-Jan-2024**	06-Jun-2024	✓	**05-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) RN13030126, RN13030697, RN13030698, RN13030715, FB01_0912, RB01_0912	**09-Dec-2023**	**08-Jan-2024**	06-Jun-2024	✓	**09-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW73	**09-Dec-2023**	**09-Jan-2024**	06-Jun-2024	✓	**09-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD04_1112	**11-Dec-2023**	**04-Jan-2024**	08-Jun-2024	✓	**05-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids - Continued							
SW20, L012-B01, FB01_1112, RB01_1112	**11-Dec-2023**	**08-Jan-2024**	08-Jun-2024	✓	**09-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW68, MW72, MW80	**11-Dec-2023**	**09-Jan-2024**	08-Jun-2024	✓	**09-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD05_1212	**12-Dec-2023**	**04-Jan-2024**	09-Jun-2024	✓	**05-Jan-2024**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01	**12-Dec-2023**	**08-Jan-2024**	09-Jun-2024	✓	**09-Jan-2024**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW33, MW69, MW70	**12-Dec-2023**	**09-Jan-2024**	09-Jun-2024	✓	**09-Jan-2024**	09-Jun-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, FB01_0512	**05-Dec-2023**	**08-Jan-2024**	02-Jun-2024	✓	**09-Jan-2024**	02-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW56, MW81	**05-Dec-2023**	**09-Jan-2024**	02-Jun-2024	✓	**09-Jan-2024**	02-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW85, MW94, RB01_0612	**06-Dec-2023**	**08-Jan-2024**	03-Jun-2024	✓	**09-Jan-2024**	03-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW40, MW49, MW78, MW82, MW83, MW84	**06-Dec-2023**	**09-Jan-2024**	03-Jun-2024	✓	**09-Jan-2024**	03-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW90, MW98, FB01_0712, RB01_0712	**07-Dec-2023**	**08-Jan-2024**	04-Jun-2024	✓	**09-Jan-2024**	04-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW42, MW59, MW74	**07-Dec-2023**	**09-Jan-2024**	04-Jun-2024	✓	**09-Jan-2024**	04-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD01_0812, BD02_0812	**08-Dec-2023**	**04-Jan-2024**	05-Jun-2024	✓	**05-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW89, MW91, RN13030692	**08-Dec-2023**	**08-Jan-2024**	05-Jun-2024	✓	**09-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW43	**08-Dec-2023**	**09-Jan-2024**	05-Jun-2024	✓	**09-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD03_0912	**09-Dec-2023**	**04-Jan-2024**	06-Jun-2024	✓	**05-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) RN13030126, RN13030697, RN13030698, RN13030715, FB01_0912, RB01_0912	**09-Dec-2023**	**08-Jan-2024**	06-Jun-2024	✓	**09-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW73	**09-Dec-2023**	**09-Jan-2024**	06-Jun-2024	✓	**09-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD04_1112	**11-Dec-2023**	**04-Jan-2024**	08-Jun-2024	✓	**05-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids - Continued							
SW20, L012-B01, FB01_1112, RB01_1112	**11-Dec-2023**	**08-Jan-2024**	08-Jun-2024	✓	**09-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW68, MW72, MW80	**11-Dec-2023**	**09-Jan-2024**	08-Jun-2024	✓	**09-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD05_1212	**12-Dec-2023**	**04-Jan-2024**	09-Jun-2024	✓	**05-Jan-2024**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01	**12-Dec-2023**	**08-Jan-2024**	09-Jun-2024	✓	**09-Jan-2024**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW33, MW69, MW70	**12-Dec-2023**	**09-Jan-2024**	09-Jun-2024	✓	**09-Jan-2024**	09-Jun-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, FB01_0512	**05-Dec-2023**	**08-Jan-2024**	02-Jun-2024	✓	**09-Jan-2024**	02-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW56, MW81	**05-Dec-2023**	**09-Jan-2024**	02-Jun-2024	✓	**09-Jan-2024**	02-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW85, MW94, RB01_0612	**06-Dec-2023**	**08-Jan-2024**	03-Jun-2024	✓	**09-Jan-2024**	03-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW40, MW49, MW78, MW82, MW83, MW84	**06-Dec-2023**	**09-Jan-2024**	03-Jun-2024	✓	**09-Jan-2024**	03-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW90, MW98, FB01_0712, RB01_0712	**07-Dec-2023**	**08-Jan-2024**	04-Jun-2024	✓	**09-Jan-2024**	04-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW42, MW59, MW74	**07-Dec-2023**	**09-Jan-2024**	04-Jun-2024	✓	**09-Jan-2024**	04-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD01_0812, BD02_0812	**08-Dec-2023**	**04-Jan-2024**	05-Jun-2024	✓	**05-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW89, MW91, RN13030692	**08-Dec-2023**	**08-Jan-2024**	05-Jun-2024	✓	**09-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW43	**08-Dec-2023**	**09-Jan-2024**	05-Jun-2024	✓	**09-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD03_0912	**09-Dec-2023**	**04-Jan-2024**	06-Jun-2024	✓	**05-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) RN13030126, RN13030697, RN13030698, RN13030715, FB01_0912, RB01_0912	**09-Dec-2023**	**08-Jan-2024**	06-Jun-2024	✓	**09-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW73	**09-Dec-2023**	**09-Jan-2024**	06-Jun-2024	✓	**09-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD04_1112	**11-Dec-2023**	**04-Jan-2024**	08-Jun-2024	✓	**05-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides - Continued							
SW20, L012-B01, FB01_1112, RB01_1112	**11-Dec-2023**	**08-Jan-2024**	08-Jun-2024	✓	**09-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW68, MW72, MW80	**11-Dec-2023**	**09-Jan-2024**	08-Jun-2024	✓	**09-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD05_1212	**12-Dec-2023**	**04-Jan-2024**	09-Jun-2024	✓	**05-Jan-2024**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01	**12-Dec-2023**	**08-Jan-2024**	09-Jun-2024	✓	**09-Jan-2024**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW33, MW69, MW70	**12-Dec-2023**	**09-Jan-2024**	09-Jun-2024	✓	**09-Jan-2024**	09-Jun-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, FB01_0512	**05-Dec-2023**	**08-Jan-2024**	02-Jun-2024	✓	**09-Jan-2024**	02-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW56, MW81	**05-Dec-2023**	**09-Jan-2024**	02-Jun-2024	✓	**09-Jan-2024**	02-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW85, MW94, RB01_0612	**06-Dec-2023**	**08-Jan-2024**	03-Jun-2024	✓	**09-Jan-2024**	03-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW40, MW49, MW78, MW82, MW83, MW84	**06-Dec-2023**	**09-Jan-2024**	03-Jun-2024	✓	**09-Jan-2024**	03-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW90, MW98, FB01_0712, RB01_0712	**07-Dec-2023**	**08-Jan-2024**	04-Jun-2024	✓	**09-Jan-2024**	04-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW42, MW59, MW74	**07-Dec-2023**	**09-Jan-2024**	04-Jun-2024	✓	**09-Jan-2024**	04-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD01_0812, BD02_0812	**08-Dec-2023**	**04-Jan-2024**	05-Jun-2024	✓	**05-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW89, MW91, RN13030692	**08-Dec-2023**	**08-Jan-2024**	05-Jun-2024	✓	**09-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW43	**08-Dec-2023**	**09-Jan-2024**	05-Jun-2024	✓	**09-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD03_0912	**09-Dec-2023**	**04-Jan-2024**	06-Jun-2024	✓	**05-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) RN13030126, RN13030697, RN13030698, RN13030715, FB01_0912, RB01_0912	**09-Dec-2023**	**08-Jan-2024**	06-Jun-2024	✓	**09-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW73	**09-Dec-2023**	**09-Jan-2024**	06-Jun-2024	✓	**09-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD04_1112	**11-Dec-2023**	**04-Jan-2024**	08-Jun-2024	✓	**05-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued							
SW20, L012-B01, FB01_1112, RB01_1112	**11-Dec-2023**	**08-Jan-2024**	08-Jun-2024	✓	**09-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW68, MW72, MW80	**11-Dec-2023**	**09-Jan-2024**	08-Jun-2024	✓	**09-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD05_1212	**12-Dec-2023**	**04-Jan-2024**	09-Jun-2024	✓	**05-Jan-2024**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01	**12-Dec-2023**	**08-Jan-2024**	09-Jun-2024	✓	**09-Jan-2024**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW33, MW69, MW70	**12-Dec-2023**	**09-Jan-2024**	09-Jun-2024	✓	**09-Jan-2024**	09-Jun-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) SW45, Notch-V1, Notch-V2, PW2, SW13, DRD, SW22, SW12, FB01_0512	**05-Dec-2023**	**08-Jan-2024**	02-Jun-2024	✓	**09-Jan-2024**	02-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW56, MW81	**05-Dec-2023**	**09-Jan-2024**	02-Jun-2024	✓	**09-Jan-2024**	02-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC3, MW85, MW94, RB01_0612	**06-Dec-2023**	**08-Jan-2024**	03-Jun-2024	✓	**09-Jan-2024**	03-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW40, MW49, MW78, MW82, MW83, MW84	**06-Dec-2023**	**09-Jan-2024**	03-Jun-2024	✓	**09-Jan-2024**	03-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) ESC4, MW90, MW98, FB01_0712, RB01_0712	**07-Dec-2023**	**08-Jan-2024**	04-Jun-2024	✓	**09-Jan-2024**	04-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW42, MW59, MW74	**07-Dec-2023**	**09-Jan-2024**	04-Jun-2024	✓	**09-Jan-2024**	04-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD01_0812, BD02_0812	**08-Dec-2023**	**04-Jan-2024**	05-Jun-2024	✓	**05-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) SW41, L006-B05, L021-B01, MW09, MW31, MW32, MW89, MW91, RN13030692	**08-Dec-2023**	**08-Jan-2024**	05-Jun-2024	✓	**09-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW43	**08-Dec-2023**	**09-Jan-2024**	05-Jun-2024	✓	**09-Jan-2024**	05-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD03_0912	**09-Dec-2023**	**04-Jan-2024**	06-Jun-2024	✓	**05-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) RN13030126, RN13030697, RN13030698, RN13030715, FB01_0912, RB01_0912	**09-Dec-2023**	**08-Jan-2024**	06-Jun-2024	✓	**09-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW73	**09-Dec-2023**	**09-Jan-2024**	06-Jun-2024	✓	**09-Jan-2024**	06-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD04_1112	**11-Dec-2023**	**04-Jan-2024**	08-Jun-2024	✓	**05-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT)							

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums - Continued							
SW20, L012-B01, FB01_1112, RB01_1112	**11-Dec-2023**	**08-Jan-2024**	08-Jun-2024	✓	**09-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW68, MW72, MW80	**11-Dec-2023**	**09-Jan-2024**	08-Jun-2024	✓	**09-Jan-2024**	08-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) BD05_1212	**12-Dec-2023**	**04-Jan-2024**	09-Jun-2024	✓	**05-Jan-2024**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) L005-B01	**12-Dec-2023**	**08-Jan-2024**	09-Jun-2024	✓	**09-Jan-2024**	09-Jun-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW33, MW69, MW70	**12-Dec-2023**	**09-Jan-2024**	09-Jun-2024	✓	**09-Jan-2024**	09-Jun-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	6	54	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	10	95	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	7	61	**11.48**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	6	54	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	6	54	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	8	62	**12.90**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	10	99	**10.10**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	7	60	**11.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	2	75	**2.67**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	6	54	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	7	58	**12.07**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	7	61	**11.48**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	8	75	**10.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	3	54	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	5	95	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	8	61	**13.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	6	54	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	54	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	5	62	**8.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	5	99	**5.05**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	60	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	4	75	**5.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	6	54	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	4	58	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	8	61	**13.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	9	60	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	4	75	**5.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	5	95	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	61	**6.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	3	54	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	54	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Major Cations - Dissolved	ED093F	5	62	**8.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	5	99	**5.05**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	60	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	4	75	**5.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	4	58	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	61	**6.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (Low Level)	EA025LL	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	3	60	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	4	75	**5.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	5	95	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	61	**6.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	54	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	5	99	**5.05**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	60	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	75	**1.33**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	4	58	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	61	**6.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	4	75	**5.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (Low Level)	EA025LL	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . Extra volume is used to counter the effect from saline water. This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2339753**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Contact	: Nathan King
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: mkowalczyk@epicenvironmental.com.au	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BC200153.02	Page	: 1 of 11
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V4)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: DANIEL PAPINCZAK		

Dates

Date Samples Received	: 19-Dec-2023 11:30	Issue Date	: 19-Dec-2023
Client Requested Due Date	: 08-Jan-2024	Scheduled Reporting Date	: **08-Jan-2024**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 8	Temperature	: 4.5°C, 12.7°C, 5.7°C, 5.5°C, 4.8°C, 6.7°C, 2.6°C, 11.9°C, 10.2°C, 10.1°C, 6.7°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 62 / 62

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples were originally received by ALS GLADSTONE on 18/12/23 and have been forwarded to ALS Brisbane for analysis. Temperature on arrival in ALS Brisbane has been noted above.**
- **Sample "SD01_0812", "SD02_0812", "SD03_0912", "SD04_1112", and "SD05_1212" has been forwarded to Eurofins , as requested. Please note that this will incur a freight forwarding fee.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025LL Suspended Solids - Low Level	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK071G Reactive Phosphorus by Discrete analyser	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
EB2339753-001	05-Dec-2023 00:00	SW45	✓	✓	✓	✓	✓	✓	✓
EB2339753-002	05-Dec-2023 00:00	Notch-V1	✓	✓	✓	✓	✓	✓	✓
EB2339753-003	05-Dec-2023 00:00	Notch-V2	✓	✓	✓	✓	✓	✓	✓
EB2339753-004	05-Dec-2023 00:00	PW2	✓	✓	✓	✓	✓	✓	✓
EB2339753-005	05-Dec-2023 00:00	SW13	✓	✓	✓	✓	✓	✓	✓
EB2339753-006	05-Dec-2023 00:00	DRD	✓	✓	✓	✓	✓	✓	✓
EB2339753-007	05-Dec-2023 00:00	SW22	✓	✓	✓	✓	✓	✓	✓
EB2339753-008	05-Dec-2023 00:00	SW12	✓	✓	✓	✓	✓	✓	✓
EB2339753-009	08-Dec-2023 00:00	SW41	✓	✓	✓	✓	✓	✓	✓
EB2339753-010	11-Dec-2023 00:00	SW20	✓	✓	✓	✓	✓	✓	✓
EB2339753-011	06-Dec-2023 00:00	ESC3	✓	✓	✓	✓	✓	✓	✓
EB2339753-012	07-Dec-2023 00:00	ESC4	✓	✓	✓	✓	✓	✓	✓
EB2339753-013	12-Dec-2023 00:00	L005-B01	✓	✓	✓	✓	✓	✓	✓
EB2339753-014	08-Dec-2023 00:00	L006-B05	✓	✓	✓	✓	✓	✓	✓
EB2339753-015	11-Dec-2023 00:00	L012-B01	✓	✓	✓	✓	✓	✓	✓
EB2339753-016	08-Dec-2023 00:00	L021-B01	✓	✓	✓	✓	✓	✓	✓
EB2339753-017	08-Dec-2023 00:00	MW09	✓	✓	✓	✓	✓	✓	✓
EB2339753-018	08-Dec-2023 00:00	MW31	✓	✓	✓	✓	✓	✓	✓
EB2339753-019	08-Dec-2023 00:00	MW32	✓	✓	✓	✓	✓	✓	✓
EB2339753-020	12-Dec-2023 00:00	MW33	✓	✓	✓	✓	✓	✓	✓
EB2339753-021	06-Dec-2023 00:00	MW40	✓	✓	✓	✓	✓	✓	✓
EB2339753-022	07-Dec-2023 00:00	MW42	✓	✓	✓	✓	✓	✓	✓
EB2339753-023	08-Dec-2023 00:00	MW43	✓	✓	✓	✓	✓	✓	✓
EB2339753-024	06-Dec-2023 00:00	MW49	✓	✓	✓	✓	✓	✓	✓
EB2339753-025	05-Dec-2023 00:00	MW56	✓	✓	✓	✓	✓	✓	✓
EB2339753-026	07-Dec-2023 00:00	MW59	✓	✓	✓	✓	✓	✓	✓
EB2339753-027	11-Dec-2023 00:00	MW68	✓	✓	✓	✓	✓	✓	✓
EB2339753-028	12-Dec-2023 00:00	MW69	✓	✓	✓	✓	✓	✓	✓
EB2339753-029	12-Dec-2023 00:00	MW70	✓	✓	✓	✓	✓	✓	✓
EB2339753-030	11-Dec-2023 00:00	MW72	✓	✓	✓	✓	✓	✓	✓
EB2339753-031	09-Dec-2023 00:00	MW73	✓	✓	✓	✓	✓	✓	✓
EB2339753-032	07-Dec-2023 00:00	MW74	✓	✓	✓	✓	✓	✓	✓
EB2339753-033	06-Dec-2023 00:00	MW78	✓	✓	✓	✓	✓	✓	✓
EB2339753-034	11-Dec-2023 00:00	MW80	✓	✓	✓	✓	✓	✓	✓
EB2339753-035	05-Dec-2023 00:00	MW81	✓	✓	✓	✓	✓	✓	✓

			WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025LL Suspended Solids - Low Level	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK071G Reactive Phosphorus by Discrete analyser	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
EB2339753-036	06-Dec-2023 00:00	MW82	✓	✓	✓	✓	✓	✓	✓
EB2339753-037	06-Dec-2023 00:00	MW83	✓	✓	✓	✓	✓	✓	✓
EB2339753-038	06-Dec-2023 00:00	MW84	✓	✓	✓	✓	✓	✓	✓
EB2339753-039	06-Dec-2023 00:00	MW85	✓	✓	✓	✓	✓	✓	✓
EB2339753-040	08-Dec-2023 00:00	MW89	✓	✓	✓	✓	✓	✓	✓
EB2339753-041	07-Dec-2023 00:00	MW90	✓	✓	✓	✓	✓	✓	✓
EB2339753-042	08-Dec-2023 00:00	MW91	✓	✓	✓	✓	✓	✓	✓
EB2339753-043	06-Dec-2023 00:00	MW94	✓	✓	✓	✓	✓	✓	✓
EB2339753-044	07-Dec-2023 00:00	MW98	✓	✓	✓	✓	✓	✓	✓
EB2339753-045	09-Dec-2023 00:00	RN13030126	✓	✓	✓	✓	✓	✓	✓
EB2339753-046	08-Dec-2023 00:00	RN13030692	✓	✓	✓	✓	✓	✓	✓
EB2339753-047	09-Dec-2023 00:00	RN13030697	✓	✓	✓	✓	✓	✓	✓
EB2339753-048	09-Dec-2023 00:00	RN13030698	✓	✓	✓	✓	✓	✓	✓
EB2339753-049	09-Dec-2023 00:00	RN13030715	✓	✓	✓	✓	✓	✓	✓
EB2339753-058	08-Dec-2023 00:00	BD01_0812	✓	✓	✓	✓	✓	✓	✓
EB2339753-059	08-Dec-2023 00:00	BD02_0812	✓	✓	✓	✓	✓	✓	✓
EB2339753-060	09-Dec-2023 00:00	BD03_0912	✓	✓	✓	✓	✓	✓	✓
EB2339753-061	11-Dec-2023 00:00	BD04_1112	✓	✓	✓	✓	✓	✓	✓
EB2339753-062	12-Dec-2023 00:00	BD05_1212	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-04 Nitrite and Nitrate
EB2339753-001	05-Dec-2023 00:00	SW45	✓	✓	✓
EB2339753-002	05-Dec-2023 00:00	Notch-V1	✓	✓	✓
EB2339753-003	05-Dec-2023 00:00	Notch-V2	✓	✓	✓
EB2339753-004	05-Dec-2023 00:00	PW2	✓	✓	✓
EB2339753-005	05-Dec-2023 00:00	SW13	✓	✓	✓
EB2339753-006	05-Dec-2023 00:00	DRD	✓	✓	✓
EB2339753-007	05-Dec-2023 00:00	SW22	✓	✓	✓
EB2339753-008	05-Dec-2023 00:00	SW12	✓	✓	✓
EB2339753-009	08-Dec-2023 00:00	SW41	✓	✓	✓
EB2339753-010	11-Dec-2023 00:00	SW20	✓	✓	✓

			WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-04 Nitrite and Nitrate
EB2339753-011	06-Dec-2023 00:00	ESC3	✓	✓	✓
EB2339753-012	07-Dec-2023 00:00	ESC4	✓	✓	✓
EB2339753-013	12-Dec-2023 00:00	L005-B01	✓	✓	✓
EB2339753-014	08-Dec-2023 00:00	L006-B05	✓	✓	✓
EB2339753-015	11-Dec-2023 00:00	L012-B01	✓	✓	✓
EB2339753-016	08-Dec-2023 00:00	L021-B01	✓	✓	✓
EB2339753-017	08-Dec-2023 00:00	MW09	✓	✓	✓
EB2339753-018	08-Dec-2023 00:00	MW31	✓	✓	✓
EB2339753-019	08-Dec-2023 00:00	MW32	✓	✓	✓
EB2339753-020	12-Dec-2023 00:00	MW33	✓	✓	✓
EB2339753-021	06-Dec-2023 00:00	MW40	✓	✓	✓
EB2339753-022	07-Dec-2023 00:00	MW42	✓	✓	✓
EB2339753-023	08-Dec-2023 00:00	MW43	✓	✓	✓
EB2339753-024	06-Dec-2023 00:00	MW49	✓	✓	✓
EB2339753-025	05-Dec-2023 00:00	MW56	✓	✓	✓
EB2339753-026	07-Dec-2023 00:00	MW59	✓	✓	✓
EB2339753-027	11-Dec-2023 00:00	MW68	✓	✓	✓
EB2339753-028	12-Dec-2023 00:00	MW69	✓	✓	✓
EB2339753-029	12-Dec-2023 00:00	MW70	✓	✓	✓
EB2339753-030	11-Dec-2023 00:00	MW72	✓	✓	✓
EB2339753-031	09-Dec-2023 00:00	MW73	✓	✓	✓
EB2339753-032	07-Dec-2023 00:00	MW74	✓	✓	✓
EB2339753-033	06-Dec-2023 00:00	MW78	✓	✓	✓
EB2339753-034	11-Dec-2023 00:00	MW80	✓	✓	✓
EB2339753-035	05-Dec-2023 00:00	MW81	✓	✓	✓
EB2339753-036	06-Dec-2023 00:00	MW82	✓	✓	✓
EB2339753-037	06-Dec-2023 00:00	MW83	✓	✓	✓
EB2339753-038	06-Dec-2023 00:00	MW84	✓	✓	✓
EB2339753-039	06-Dec-2023 00:00	MW85	✓	✓	✓
EB2339753-040	08-Dec-2023 00:00	MW89	✓	✓	✓
EB2339753-041	07-Dec-2023 00:00	MW90	✓	✓	✓
EB2339753-042	08-Dec-2023 00:00	MW91	✓	✓	✓
EB2339753-043	06-Dec-2023 00:00	MW94	✓	✓	✓
EB2339753-044	07-Dec-2023 00:00	MW98	✓	✓	✓
EB2339753-045	09-Dec-2023 00:00	RN13030126	✓	✓	✓
EB2339753-046	08-Dec-2023 00:00	RN13030692	✓	✓	✓
EB2339753-047	09-Dec-2023 00:00	RN13030697	✓	✓	✓
EB2339753-048	09-Dec-2023 00:00	RN13030698	✓	✓	✓
EB2339753-049	09-Dec-2023 00:00	RN13030715	✓	✓	✓
EB2339753-050	05-Dec-2023 00:00	FB01_0512		✓	
EB2339753-051	07-Dec-2023 00:00	FB01_0712		✓	

			WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-04 Nitrite and Nitrate
EB2339753-052	09-Dec-2023 00:00	FB01_0912		✓	
EB2339753-053	11-Dec-2023 00:00	FB01_1112		✓	
EB2339753-054	06-Dec-2023 00:00	RB01_0612		✓	
EB2339753-055	07-Dec-2023 00:00	RB01_0712		✓	
EB2339753-056	09-Dec-2023 00:00	RB01_0912		✓	
EB2339753-057	11-Dec-2023 00:00	RB01_1112		✓	
EB2339753-058	08-Dec-2023 00:00	BD01_0812	✓	✓	✓
EB2339753-059	08-Dec-2023 00:00	BD02_0812	✓	✓	✓
EB2339753-060	09-Dec-2023 00:00	BD03_0912	✓	✓	✓
EB2339753-061	11-Dec-2023 00:00	BD04_1112	✓	✓	✓
EB2339753-062	12-Dec-2023 00:00	BD05_1212	✓	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA005-P: pH by Auto Titrator							
BD01_0812	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	×	----	----
BD02_0812	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	×	----	----
BD03_0912	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	×	----	----
BD04_1112	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	×	----	----
BD05_1212	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	×	----	----
DRD	Clear Plastic Bottle - Natural	----	05-Dec-2023	19-Dec-2023	×	----	----
ESC3	Clear Plastic Bottle - Natural	----	06-Dec-2023	19-Dec-2023	×	----	----
ESC4	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	×	----	----
L005-B01	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	×	----	----
L006-B05	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	×	----	----
L012-B01	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	×	----	----
L021-B01	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	×	----	----
MW09	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	×	----	----
MW31	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	×	----	----
MW32	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	×	----	----
MW33	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	×	----	----
MW40	Clear Plastic Bottle - Natural	----	06-Dec-2023	19-Dec-2023	×	----	----
MW42	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	×	----	----
MW43	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	×	----	----
MW49	Clear Plastic Bottle - Natural	----	06-Dec-2023	19-Dec-2023	×	----	----
MW56	Clear Plastic Bottle - Natural	----	05-Dec-2023	19-Dec-2023	×	----	----
MW59	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	×	----	----
MW68	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	×	----	----
MW69	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	×	----	----
MW70	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	×	----	----
MW72	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	×	----	----
MW73	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	×	----	----
MW74	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	×	----	----

MW78	Clear Plastic Bottle - Natural	----	06-Dec-2023	19-Dec-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
MW81	Clear Plastic Bottle - Natural	----	05-Dec-2023	19-Dec-2023	✘	----	----
MW82	Clear Plastic Bottle - Natural	----	06-Dec-2023	19-Dec-2023	✘	----	----
MW83	Clear Plastic Bottle - Natural	----	06-Dec-2023	19-Dec-2023	✘	----	----
MW84	Clear Plastic Bottle - Natural	----	06-Dec-2023	19-Dec-2023	✘	----	----
MW85	Clear Plastic Bottle - Natural	----	06-Dec-2023	19-Dec-2023	✘	----	----
MW89	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW90	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
MW91	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW94	Clear Plastic Bottle - Natural	----	06-Dec-2023	19-Dec-2023	✘	----	----
MW98	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	05-Dec-2023	19-Dec-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	05-Dec-2023	19-Dec-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	05-Dec-2023	19-Dec-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	05-Dec-2023	19-Dec-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	05-Dec-2023	19-Dec-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	05-Dec-2023	19-Dec-2023	✘	----	----
SW41	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
SW45	Clear Plastic Bottle - Natural	----	05-Dec-2023	19-Dec-2023	✘	----	----
EA015H: Total Dissolved Solids (High Level)							
BD01_0812	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
BD02_0812	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
BD03_0912	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
BD04_1112	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
ESC3	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
ESC4	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
L006-B05	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
L012-B01	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
L021-B01	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW09	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW31	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW32	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW42	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW43	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW49	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW56	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
MW59	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW68	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW78	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
MW81	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
MW82	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW83	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW84	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW85	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW89	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW90	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW91	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW94	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW98	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----

RN13030692	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
SW41	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
SW45	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
EA025LL: Suspended Solids (Low Level)							
BD01_0812	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
BD02_0812	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
BD03_0912	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
BD04_1112	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
ESC3	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
ESC4	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
L006-B05	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
L012-B01	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
L021-B01	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW09	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW31	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW32	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW42	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW43	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW49	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW56	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
MW59	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW68	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW78	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
MW81	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
MW82	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW83	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW84	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW85	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW89	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW90	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW91	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW94	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW98	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
SW41	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
SW45	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
ED093F: Major Cations - Dissolved							
BD01_0812	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
BD02_0812	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
BD03_0912	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
BD04_1112	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----

ESC3	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
ESC4	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
L006-B05	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
L012-B01	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
L021-B01	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW09	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW31	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW32	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW42	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW43	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW49	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW56	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
MW59	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW68	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW78	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
MW81	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
MW82	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW83	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW84	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW85	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW89	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW90	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW91	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
MW94	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW98	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	16-Dec-2023	19-Dec-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	18-Dec-2023	19-Dec-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
SW41	Clear Plastic Bottle - Natural	----	15-Dec-2023	19-Dec-2023	✘	----	----
SW45	Clear Plastic Bottle - Natural	----	12-Dec-2023	19-Dec-2023	✘	----	----
EK057G: Nitrite as N by Discrete Analyser							
BD01_0812	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
BD02_0812	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
BD03_0912	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
BD04_1112	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
BD05_1212	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
ESC3	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
ESC4	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
L005-B01	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
L006-B05	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
L012-B01	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
L021-B01	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW09	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW31	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW32	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW33	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW42	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
MW43	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW49	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW56	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----

MW59	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
MW68	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW69	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW70	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
MW78	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW81	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
MW82	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW83	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW84	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW85	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW89	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW90	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
MW91	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW94	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW98	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
SW41	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
SW45	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
EK071G: Reactive Phosphorus as P-By Discrete Analyser							
BD01_0812	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
BD02_0812	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
BD03_0912	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
BD04_1112	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
BD05_1212	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
DRD	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
ESC3	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
ESC4	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
L005-B01	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
L006-B05	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
L012-B01	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
L021-B01	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW09	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW31	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW32	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW33	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW40	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW42	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
MW43	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW49	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW56	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
MW59	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
MW68	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW69	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW70	Clear Plastic Bottle - Natural	----	14-Dec-2023	19-Dec-2023	✘	----	----
MW72	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW73	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
MW74	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
MW78	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW80	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
MW81	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
MW82	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----

MW83	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW84	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW85	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW89	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW90	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
MW91	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
MW94	Clear Plastic Bottle - Natural	----	08-Dec-2023	19-Dec-2023	✘	----	----
MW98	Clear Plastic Bottle - Natural	----	09-Dec-2023	19-Dec-2023	✘	----	----
Notch-V1	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
Notch-V2	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
PW2	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
RN13030126	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
RN13030692	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
RN13030697	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
RN13030698	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
RN13030715	Clear Plastic Bottle - Natural	----	11-Dec-2023	19-Dec-2023	✘	----	----
SW12	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
SW13	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
SW20	Clear Plastic Bottle - Natural	----	13-Dec-2023	19-Dec-2023	✘	----	----
SW22	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----
SW41	Clear Plastic Bottle - Natural	----	10-Dec-2023	19-Dec-2023	✘	----	----
SW45	Clear Plastic Bottle - Natural	----	07-Dec-2023	19-Dec-2023	✘	----	----

Requested Deliverables

CS ENERGY ENVIRONMENTAL DATA

- *AU Certificate of Analysis - NATA (COA)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	CSEnergyEnvironmentData@csenergy.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	CSEnergyEnvironmentData@csenergy.com.au
- Chain of Custody (CoC) (COC)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	CSEnergyEnvironmentData@csenergy.com.au
- EDI Format - ESDAT (ESDAT)	Email	CSEnergyEnvironmentData@csenergy.com.au

ESDAT REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au

INVOICES

- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au

INVOICES & RESULTS

- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au

LUKE AMIES

- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au

epic

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE QUATERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	1 of 5
Number of Eskies:	8

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

Please Split Reports:		SAMPLE ID	DATE	MATRIX	60ml Metals	50ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS
1	AA	SW45	5/12/2023	w	1	1	1	2	
2	AA	Notch-V1	5/12/2023	w	1	1	1	2	
3	AA	Notch-V2	5/12/2023	w	1	1	1	2	
4	AA	PW2	5/12/2023	w	1	1	1	2	
5	AA	SW13	5/12/2023	w	1	1	1	2	
6	AA	DRD	5/12/2023	w	1	1	1	2	
7	AA	SW22	5/12/2023	w	1	1	1	2	
8	AA	SW12	5/12/2023	w	1	1	1	2	
9	AA	SW41	8/12/2023	w	1	1	1	2	
10	AA	SW20	11/12/2023	w	1	1	1	2	
11	AA	ESC3	6/12/2023	w	1	1	1	2	
12	AA	ESC4	7/12/2023	w	1	1	1	2	
13	AB	L005-B01	12/12/2023	w	1	1	1	2	
14	AC	L006-B05	8/12/2023	w	1	1	1	2	
15	AD	L012-B01	11/12/2023	w	1	1	1	2	
16	AE	L021-B01	8/12/2023	w	1	1	1	2	
17	AA	MW09	8/12/2023	w	1	1	1	2	
18	AA	MW31	8/12/2023	w	1	1	1	2	
19	AA	MW32	8/12/2023	w	1	1	1	2	
20	AA	MW33	12/12/2023	w	1	1	1	2	

Potable Water							
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	

Bore Water														SOIL	
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	PFAS (EP231X)	HOLD
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			
x	x	x	x	x	x	x	x	x	x	x			

Relinquished By:		Received By	
Dan Papinczak		SIGNATURE	
0439 115 598	14-Dec-23	DATE	16.12.23

Custody Seals Intact — Y N / Y N

NOTES: Please report with CS Energy EDD format; ENVNC_V4

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

Rec'd: 8:30 19/12 1130

HT

Environmental Division
Brisbane
Work Order Reference
EB2339753

Telephone : + 61-7-3243 7222

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE QUATERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	2 of 5
Number of Eskies:	8

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

Please Split Reports:		SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS
21	AA	MW40	6/12/2023	w	1	1	1	2	
22	AA	MW42	7/12/2023	w	1	1	1	2	
23	AA	MW43	8/12/2023	w	1	1	1	2	
24	AA	MW49	6/12/2023	w	1	1	1	2	
25	AA	MW56	5/12/2023	w	1	1	1	2	
26	AA	MW59	7/12/2023	w	1	1	1	2	
27	AA	MW68	11/12/2023	w	1	1	1	2	
28	AA	MW69	12/12/2023	w	1	1	1	2	
29	AA	MW70	12/12/2023	w	1	1	1	2	
30	AA	MW72	11/12/2023	w	1	1	1	2	
	AA	~~MW72~~	~~11/12/2023~~	w	1	1	1	2	
31	AA	MW73	9/12/2023	w	1	1	1	2	
32	AA	MW74	7/12/2023	w	1	1	1	2	
33	AA	MW78	6/12/2023	w	1	1	1	2	
34	AA	MW80	11/12/2023	w	1	1	1	2	
35	AA	MW81	5/12/2023	w	1	1	1	2	
36	AA	MW82	6/12/2023	w	1	1	1	2	
37	AA	MW83	6/12/2023	w	1	1	1	2	
38	AA	MW84	6/12/2023	w	1	1	1	2	
39	AA	MW85	6/12/2023	w	1	1	1	2	

Potable Water								Bore Water														SOIL	
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)		pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	PFAS (EP231X)	HOLD
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			

Relinquished By:	Received By	Custody Seals Intact Y N
Dan Papinczak		Samples Received Chilled Y N
0439 115 598 14-Dec-23	SIGNATURE DATE	Method of Shipment

NOTES: Please report with CS Energy EDD format; ENVNC_V4

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE QUATERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	3 of 5
Number of Eskies:	8

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

Please Split Reports:		SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other GLASS
40	AA	MW89	8/12/2023	w	1	1	1	2	
41	AA	MW90	7/12/2023	w	1	1	1	2	
42	AA	MW91	8/12/2023	w	1	1	1	2	
43	AA	MW94	6/12/2023	w	1	1	1	2	
44	AA	MW98	7/12/2023	w	1	1	1	2	
45	AA	RN13030126	9/12/2023	w	1	1	1	2	
46	AA	RN13030692	8/12/2023	w	1	1	1	2	
47	AA	RN13030697	9/12/2023	w	1	1	1	2	
48	AA	RN13030698	9/12/2023	w	1	1	1	2	
49	AA	RN13030715	9/12/2023	w	1	1	1	2	
50	AA	FB01_0512	5/12/2023	w				2	
51	AA	FB01_0712	7/12/2023	w				2	
52	AA	FB01_0912	9/12/2023	w				2	
53	AA	FB01_1112	11/12/2023	w				2	
54	AA	RB01_0612	6/12/2023	w				2	
55	AA	RB01_0712	7/12/2023	w				2	
56	AA	RB01_0912	9/12/2023	w				2	
57	AA	RB01_1112	11/12/2023	w				2	
58	AA	BD01_0812	8/12/2023	w	1	1	1	2	
59	AA	BD02_0812	8/12/2023	w	1	1	1	2	

Potable Water								Bore Water														SOIL	
pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)		pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	PFAS (EP231X)	HOLD
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			
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																		x			
								x	x	x	x	x	x	x	x	x	x	x			
								x	x	x	x	x	x	x	x	x	x	x			

Custody Seals Intact	Y N
Samples Received Chilled	Y N
Method of Shipment	

Relinquished By:
Dan Papinczak
0439 115 598
14-Dec-23

Received By
SIGNATURE DATE

NOTES: Please report with CS Energy EDD format; ENVNC_V4

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE QUATERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	4 of 5
Number of Eskies:	8

Lab:	ALS
Lab Quote No:	BN/344/21-V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

Please Split Reports:	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Jars Plastic	Jars GLASS	Potable Water: pH (EA005P)	Potable Water: EC (EA010P)	Potable Water: TDS - Standard (EA015H)	Potable Water: Reactive P (EK071G)	Potable Water: Major Anions/Cations (NT-01 and NT02A)	Potable Water: Ionic Balance (EN055-PG)	Potable Water: PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water: pH (EA005P)	Bore Water: EC (EA010P)	Bore Water: TDS - Standard (EA015H)	Bore Water: Suspended Solids - Low Level (EA025LL)	Bore Water: Ammonia (EK055G)	Bore Water: Reactive P (EK071G)	Bore Water: Nitrate and Nitrite (NT-04)	Bore Water: Major Anions/Cations (NT-01 and NT02A)	Bore Water: Ionic Balance (EN055-PG)	Bore Water: Total Metals (Fe and Mn) (EG020T)	Bore Water: PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	SOIL: TOPA (EP231X-LL (TOPI) + TOF (EP040)	SOIL: PFAS (EP231X)	HOLD
60 AA	BD03_0912	9/12/2023	W	1	1	1	2										x	x	x	x	x	x	x	x	x	x	x			
61 AA	BD04_1112	11/12/2023	W	1	1	1	2										x	x	x	x	x	x	x	x	x	x	x			
62 AA	BD05_1212	12/12/2023	W	1	1	3	2										x	x	x	x	x	x	x	x	x	x	x			

Relinquished By:
Dan Papinczak
0439 115 598
14-Dec-23

Received By
SIGNATURE DATE

Custody Seals Intact Y N
Samples Received Chilled Y N
Method of Shipment

NOTES: Please report with CS Energy EDD format; ENVNC_V4

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au
email CSEnergyEnvironmentData@csenergy.com.au

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

Date Time: 20/12/23 1:45pm

Chilled Temp: 0

Correction: 11.7°C

Final Temp:

Jennifer Brodie

Chain of Custody Record

Project No:	BC200153.03
Project/Site:	CALLIDE QUATERLY MONITORING
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Dan Papinczak (dpapinczak@epicenvironmental.com.au)
Phone:	0439 115 598
Page:	5
Number of Eskies:	8 of 5

| | | |

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Asb)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	1277 Cameron Road,
Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Luke Amies
Project name:	CALLIDE QUARTERLY MONITORING
Project ID:	BC200153.03
Turnaround time:	10 Day
Date/Time received	Dec 20, 2023 1:45 PM
Eurofins reference	1056112

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Luke Amies - lamies@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	T: +61 7 3902 4600	+61 2 4968 8448
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Eurofins Environment Testing NZ Ltd
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Penrose,	Mount Wellington,	Rolleston,	Gate Pa,
Auckland 1061	Auckland 1061	Christchurch 7675	Tauranga 3112
+64 9 526 4551	+64 9 525 0568	+64 3 343 5201	+64 9 525 0568
IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Order No.: BC200153.03
Report #: 1056112
Phone: 0400 497 512
Fax:

Received: Dec 20, 2023 1:45 PM
Due: Jan 8, 2024
Priority: 10 Day
Contact Name: Luke Amies

Project Name: CALLIDE QUARTERLY MONITORING
Project ID: BC200153.03

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Ionic Balance*	Iron	Manganese	Nitrate & Nitrite (as N)	pH (at 25 °C)	Phosphorus reactive (as P)	Total Suspended Solids Dried at 103 °C to 105 °C	Eurofins Suite B11E: Cl/SO4/Alkalinity	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X		X			X		X					
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X		X	X	X	X	X
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	SD01_0812	Dec 08, 2023		Water	B23-De0050247	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SD02_0812	Dec 08, 2023		Water	B23-De0050248	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SD03_0912	Dec 09, 2023		Water	B23-De0050249	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SD04_1112	Dec 11, 2023		Water	B23-De0050250	X	X	X	X	X	X	X	X	X	X	X	X	X
5	SD05_1212	Dec 12, 2023		Water	B23-De0050251	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						5	5	5	5	5	5	5	5	5	5	5	5	5

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Luke Amies**

Report **1056112-W**
Project name CALLIDE QUARTERLY MONITORING
Project ID BC200153.03
Received Date Dec 20, 2023

Client Sample ID			**SD01_0812**	**SD02_0812**	**SD03_0912**	**SD04_1112**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**B23-De0050247**	**B23-De0050248**	**B23-De0050249**	**B23-De0050250**
Date Sampled			**Dec 08, 2023**	**Dec 08, 2023**	**Dec 09, 2023**	**Dec 11, 2023**
Test/Reference	LOR	Unit				
Ammonia (as N)	0.01	mg/L	0.24	< 0.01	0.13	0.17
Chloride	1	mg/L	1500	940	820	2700
Conductivity (at 25 °C)	10	uS/cm	5200	3300	3200	9300
Ionic Balance*	0.01	%	-18.2	-12.4	-13.9	-13.0
Nitrate & Nitrite (as N)	0.05	mg/L	0.07	3.5	0.071	< 0.05
pH (at 25 °C)	0.1	pH Units	7.5	7.1	7.6	7.2
Phosphorus reactive (as P)	0.01	mg/L	0.08	0.03	0.09	0.07
Sulphate (as SO4)	5	mg/L	19	120	72	640
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	3100	2900	2200	6200
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	14	48	< 5	16
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	630	160	320	710
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	630	160	320	710
Heavy Metals						
Iron	0.05	mg/L	0.09	24	0.10	0.97
Manganese	0.005	mg/L	0.19	0.009	< 0.005	0.26
Eurofins Suite B11C: Na/K/Ca/Mg						
Calcium	0.5	mg/L	80	190	130	190
Magnesium	0.5	mg/L	210	110	84	330
Potassium	0.5	mg/L	< 0.5	1.7	1.2	1.1
Sodium	0.5	mg/L	390	130	230	990
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace						
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SD01_0812	SD02_0812	SD03_0912	SD04_1112
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			B23-De0050247	B23-De0050248	B23-De0050249	B23-De0050250
Date Sampled			Dec 08, 2023	Dec 08, 2023	Dec 09, 2023	Dec 11, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace						
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C4-PFBA (surr.)	1	%	35	89	94	36
13C5-PFPeA (surr.)	1	%	112	88	97	48
13C5-PFHxA (surr.)	1	%	100	123	138	78
13C4-PFHpA (surr.)	1	%	114	85	100	116
13C8-PFOA (surr.)	1	%	92	85	111	88
13C5-PFNA (surr.)	1	%	92	112	115	66
13C6-PFDA (surr.)	1	%	64	107	96	59
13C2-PFUnDA (surr.)	1	%	54	69	61	73
13C2-PFDoDA (surr.)	1	%	36	60	54	61
13C2-PFTeDA (surr.)	1	%	30	42	36	43
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	< 0.001	0.005	< 0.001	0.046
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	[N09]< 0.001
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	< 0.001	0.002	< 0.001	0.026
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	< 0.001	[N09]0.007	< 0.001	[N09]0.039
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	< 0.001	[N09]0.037	[N09]0.002	[N09]0.21
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	< 0.001	[N09]0.002	< 0.001	[N09]0.009
Perfluorooctanesulfonic acid (PFOS)[N11]	0.0001	ug/L	[N09]0.0005	0.081	[N09]0.0002	0.33
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
13C3-PFBS (surr.)	1	%	102	72	53	65
18O2-PFHxS (surr.)	1	%	63	73	93	93
13C8-PFOS (surr.)	1	%	65	64	87	86
Perfluoroalkyl sulfonamido substances- Ultra Trace						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
13C8-FOSA (surr.)	1	%	19	46	49	49
D3-N-MeFOSA (surr.)	1	%	INT	114	122	138
D5-N-EtFOSA (surr.)	1	%	11	129	152	167
D7-N-MeFOSE (surr.)	1	%	INT	56	55	59
D9-N-EtFOSE (surr.)	1	%	INT	57	56	59
D5-N-EtFOSAA (surr.)	1	%	52	67	66	73
D3-N-MeFOSAA (surr.)	1	%	45	75	72	75
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	< 0.005	< 0.005	< 0.005	< 0.005
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			SD01_0812	SD02_0812	SD03_0912	SD04_1112
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			B23-De0050247	B23-De0050248	B23-De0050249	B23-De0050250
Date Sampled			Dec 08, 2023	Dec 08, 2023	Dec 09, 2023	Dec 11, 2023
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace						
13C2-4:2 FTSA (surr.)	1	%	77	23	49	52
13C2-6:2 FTSA (surr.)	1	%	119	79	90	51
13C2-8:2 FTSA (surr.)	1	%	68	155	132	129
13C2-10:2 FTSA (surr.)	1	%	115	111	104	135
PFASs Summations						
Sum (PFHxS + PFOS)*	0.001	ug/L	< 0.001	0.118	0.0022	0.54
Sum of US EPA PFAS (PFOS + PFOA)*	0.001	ug/L	< 0.001	0.081	< 0.001	0.33
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	ug/L	< 0.001	0.118	0.0022	0.54
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	< 0.005	0.123	< 0.005	0.586
Sum of PFASs (n=30)*	0.005	ug/L	< 0.005	0.134	< 0.005	0.66

Client Sample ID			SD05_1212
Sample Matrix			Water
Eurofins Sample No.			B23-De0050251
Date Sampled			Dec 12, 2023
Test/Reference	LOR	Unit	
Ammonia (as N)	0.01	mg/L	0.04
Chloride	1	mg/L	240
Conductivity (at 25 °C)	10	uS/cm	1300
Ionic Balance*	0.01	%	-10.0
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05
pH (at 25 °C)	0.1	pH Units	7.2
Phosphorus reactive (as P)	0.01	mg/L	0.03
Sulphate (as SO4)	5	mg/L	77
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	760
Total Suspended Solids Dried at 103 °C to 105 °C	5	mg/L	37
Alkalinity (speciated)			
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	220
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20
Total Alkalinity (as CaCO3)	20	mg/L	220
Heavy Metals			
Iron	0.05	mg/L	0.85
Manganese	0.005	mg/L	0.067
Eurofins Suite B11C: Na/K/Ca/Mg			
Calcium	0.5	mg/L	74
Magnesium	0.5	mg/L	42
Potassium	0.5	mg/L	1.8
Sodium	0.5	mg/L	74
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace			
Perfluorobutanoic acid (PFBA)[N11]	0.005	ug/L	< 0.005
Perfluorodecanoic acid (PFDA)[N11]	0.001	ug/L	< 0.001
Perfluorododecanoic acid (PFDoDA)[N11]	0.001	ug/L	< 0.001
Perfluoroheptanoic acid (PFHpA)[N11]	0.001	ug/L	< 0.001
Perfluorohexanoic acid (PFHxA)[N11]	0.001	ug/L	< 0.001

Client Sample ID			SD05_1212
Sample Matrix			Water
Eurofins Sample No.			B23-De0050251
Date Sampled			Dec 12, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace			
Perfluorononanoic acid (PFNA)[N11]	0.001	ug/L	< 0.001
Perfluorooctanoic acid (PFOA)[N11]	0.001	ug/L	< 0.001
Perfluoropentanoic acid (PFPeA)[N11]	0.001	ug/L	< 0.001
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.001	ug/L	< 0.001
Perfluorotridecanoic acid (PFTrDA)[N15]	0.001	ug/L	< 0.001
Perfluoroundecanoic acid (PFUnDA)[N11]	0.001	ug/L	< 0.001
13C4-PFBA (surr.)	1	%	51
13C5-PFPeA (surr.)	1	%	46
13C5-PFHxA (surr.)	1	%	89
13C4-PFHpA (surr.)	1	%	136
13C8-PFOA (surr.)	1	%	101
13C5-PFNA (surr.)	1	%	100
13C6-PFDA (surr.)	1	%	78
13C2-PFUnDA (surr.)	1	%	72
13C2-PFDoDA (surr.)	1	%	62
13C2-PFTeDA (surr.)	1	%	34
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.001	ug/L	0.003
Perfluorononanesulfonic acid (PFNS)[N15]	0.001	ug/L	< 0.001
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.001	ug/L	< 0.001
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.001	ug/L	[N09]0.002
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.001	ug/L	[N09]0.013
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.001	ug/L	< 0.001
Perfluorooctanesulfonic acid (PFOS)[N11]	0.0001	ug/L	[N09]0.034
Perfluorodecanesulfonic acid (PFDS)[N15]	0.001	ug/L	< 0.001
13C3-PFBS (surr.)	1	%	72
18O2-PFHxS (surr.)	1	%	69
13C8-PFOS (surr.)	1	%	74
Perfluoroalkyl sulfonamido substances- Ultra Trace			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.005	ug/L	< 0.005
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.005	ug/L	< 0.005
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.005	ug/L	< 0.005
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.005	ug/L	< 0.005
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.005	ug/L	< 0.005
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.005	ug/L	< 0.005
Perfluorooctane sulfonamide (FOSA)[N11]	0.005	ug/L	< 0.005
13C8-FOSA (surr.)	1	%	38
D3-N-MeFOSA (surr.)	1	%	99
D5-N-EtFOSA (surr.)	1	%	124
D7-N-MeFOSE (surr.)	1	%	42
D9-N-EtFOSE (surr.)	1	%	46
D5-N-EtFOSAA (surr.)	1	%	77
D3-N-MeFOSAA (surr.)	1	%	84

Client Sample ID			SD05_1212
Sample Matrix			**Water**
Eurofins Sample No.			**B23-De0050251**
Date Sampled			**Dec 12, 2023**
Test/Reference	LOR	Unit	
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.001	ug/L	< 0.001
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.005	ug/L	< 0.005
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.001	ug/L	< 0.001
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.001	ug/L	< 0.001
13C2-4:2 FTSA (surr.)	1	%	84
13C2-6:2 FTSA (surr.)	1	%	61
13C2-8:2 FTSA (surr.)	1	%	118
13C2-10:2 FTSA (surr.)	1	%	64
PFASs Summations			
Sum (PFHxS + PFOS)*	0.001	ug/L	0.047
Sum of US EPA PFAS (PFOS + PFOA)*	0.001	ug/L	0.034
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.001	ug/L	0.047
Sum of WA DWER PFAS (n=10)*	0.005	ug/L	0.05
Sum of PFASs (n=30)*	0.005	ug/L	0.052

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Ammonia (as N)	Brisbane	Jan 19, 2024	28 Days
- Method: LTM-INO-4450 Determination of Nitrogen Species by Discrete Analyser			
- Method: LTM-INO-4200 Ammonia by Discrete Analyser			
Conductivity (at 25 °C)	Brisbane	Dec 27, 2023	28 Days
- Method: APHA 2510B			
Nitrate & Nitrite (as N)	Brisbane	Jan 19, 2024	28 Days
- Method: LTM-INO-4450 Determination of Nitrogen Species by Discrete Analyser			
- Method: LTM-INO-4350 Determination of NO2, NO3, NOx in Water by Discrete Analyser			
pH (at 25 °C)	Brisbane	Dec 27, 2023	0 Days
- Method: LTM-GEN-7090 pH in water by ISE			
Phosphorus reactive (as P)	Melbourne	Jan 16, 2024	2 Days
- Method: APHA 4500-P			
Total Suspended Solids Dried at 103 °C to 105 °C	Brisbane	Jan 02, 2024	7 Days
- Method: APHA 2540 D			
Heavy Metals	Brisbane	Dec 29, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Brisbane	Dec 29, 2023	180 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11E: Cl/SO4/Alkalinity			
Chloride	Brisbane	Dec 29, 2023	28 Day
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Sulphate (as SO4)	Brisbane	Dec 29, 2023	28 Day
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Alkalinity (speciated)	Brisbane	Dec 27, 2023	14 Day
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Brisbane	Jan 02, 2024	7 Days
- Method: APHA 2540 C			
Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace			
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace	Brisbane	Dec 29, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace	Brisbane	Dec 29, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
Perfluoroalkyl sulfonamido substances- Ultra Trace	Brisbane	Dec 29, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) Ultra trace			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace	Brisbane	Dec 29, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - ultra trace			
PFASs Summations	Brisbane	Dec 29, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) - low level			

eurofins

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Project Name: CALLIDE QUARTERLY MONITORING
Project ID: BC200153.03

Order No.: BC200153.03
Report #: 1056112
Phone: 0400 497 512
Fax:

Received: Dec 20, 2023 1:45 PM
Due: Jan 8, 2024
Priority: 10 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Ammonia (as N)	Conductivity (at 25 °C)	Ionic Balance*	Iron	Manganese	Nitrate & Nitrite (as N)	pH (at 25 °C)	Phosphorus reactive (as P)	Total Suspended Solids Dried at 103 °C to 105 °C	Eurofins Suite B11E: Cl/SO4/Alkalinity	Per- and Polyfluoroalkyl Substances (PFASs) - Ultra Trace	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X		X			X		X					
Brisbane Laboratory - NATA # 1261 Site # 20794							X		X	X		X		X	X	X	X	X
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	SD01_0812	Dec 08, 2023		Water	B23-De0050247	X	X	X	X	X	X	X	X	X	X	X	X	X
2	SD02_0812	Dec 08, 2023		Water	B23-De0050248	X	X	X	X	X	X	X	X	X	X	X	X	X
3	SD03_0912	Dec 09, 2023		Water	B23-De0050249	X	X	X	X	X	X	X	X	X	X	X	X	X
4	SD04_1112	Dec 11, 2023		Water	B23-De0050250	X	X	X	X	X	X	X	X	X	X	X	X	X
5	SD05_1212	Dec 12, 2023		Water	B23-De0050251	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						5	5	5	5	5	5	5	5	5	5	5	5	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	**Colour:** Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	mg/L	< 5			5	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	mg/L	-			20	N/A	
Carbonate Alkalinity (as CaCO3)	mg/L	-			20	N/A	
Hydroxide Alkalinity (as CaCO3)	mg/L	-			20	N/A	
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Heavy Metals							
Iron	mg/L	< 0.05			0.05	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Method Blank							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.005			0.005	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.001			0.001	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.001			0.001	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.001			0.001	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.001			0.001	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.001			0.001	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.001			0.001	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.001			0.001	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.001			0.001	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.001			0.001	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.001			0.001	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.001			0.001	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.001			0.001	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.0001			0.0001	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.001			0.001	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances- Ultra Trace							
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.005			0.005	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.005			0.005	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.005			0.005	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.005			0.005	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.005			0.005	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.005			0.005	Pass	
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.005			0.005	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.001			0.001	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Ammonia (as N)	%	100			70-130	Pass	
Chloride	%	118			70-130	Pass	
Nitrate & Nitrite (as N)	%	109			70-130	Pass	
Phosphorus reactive (as P)	%	101			70-130	Pass	
Sulphate (as SO4)	%	101			70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	%	93			70-130	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	%	98			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	%	120			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Iron	%	83			80-120	Pass	
Manganese	%	85			80-120	Pass	
LCS - % Recovery							
Eurofins Suite B11C: Na/K/Ca/Mg							
Calcium	%	116			80-120	Pass	
Magnesium	%	91			80-120	Pass	
Potassium	%	86			80-120	Pass	
Sodium	%	89			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace							
Perfluorobutanoic acid (PFBA)	%	90			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	97			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	76			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	82			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	97			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	93			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	87			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	89			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	83			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	58			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	80			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace							
Perfluorobutanesulfonic acid (PFBS)	%	96			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	80			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	98			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	104			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	93			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	95			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	64			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances- Ultra Trace							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	96			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	61			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	74			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	75			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	84			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	76			50-150	Pass	
Perfluorooctane sulfonamide (FOSA)	%	87			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	74			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Nitrate & Nitrite (as N)	M24-Ja0007428	NCP	%	112			70-130	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Calcium	B23-De0048421	NCP	%	102			75-125	Pass	
Magnesium	B23-De0048421	NCP	%	93			75-125	Pass	
Sodium	B23-De0048421	NCP	%	75			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1					
Perfluorodecanoic acid (PFDA)	B23-De0056426	NCP	%	93			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-De0056426	NCP	%	82			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-De0056426	NCP	%	87			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B23-De0056426	NCP	%	59			50-150	Pass	
Perfluorononanoic acid (PFNA)	B23-De0056426	NCP	%	97			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B23-De0056426	NCP	%	94			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-De0056426	NCP	%	92			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-De0056426	NCP	%	95			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-De0056426	NCP	%	87			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B23-De0056426	NCP	%	86			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-De0056426	NCP	%	81			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-De0056426	NCP	%	81			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-De0056426	NCP	%	131			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-De0056426	NCP	%	104			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-De0056426	NCP	%	102			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-De0056426	NCP	%	86			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-De0056426	NCP	%	67			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-De0056426	NCP	%	84			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-De0056426	NCP	%	81			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-De0056426	NCP	%	74			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-De0056426	NCP	%	83			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-De0056426	NCP	%	76			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-De0056426	NCP	%	80			50-150	Pass	
Perfluorooctane sulfonamide (FOSA)	B23-De0056426	NCP	%	91			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-De0056426	NCP	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-De0056426	NCP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-De0056426	NCP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-De0056426	NCP	%	90			50-150	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Iron	B23-De0050249	CP	%	79			75-125	Pass	
Manganese	B23-De0050249	CP	%	84			75-125	Pass	
Spike - % Recovery									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1					
Potassium	B23-De0050249	CP	%	87			75-125	Pass	
Spike - % Recovery									
				Result 1					
Chloride	B23-De0050250	CP	%	118			70-130	Pass	
Sulphate (as SO4)	B23-De0050250	CP	%	86			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M24-Ja0006563	NCP	mg/L	0.06	0.08	20	30%	Pass	
Nitrate & Nitrite (as N)	M24-Ja0006563	NCP	mg/L	4.9	5.0	1.3	30%	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	B23-De0051124	NCP	mg/L	1000	920	11	30%	Pass	
Total Suspended Solids Dried at 103 °C to 105 °C	B23-De0051124	NCP	mg/L	450	420	6.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Iron	B23-De0050247	CP	mg/L	0.09	0.11	17	30%	Pass	
Manganese	B23-De0050247	CP	mg/L	0.19	0.19	4.3	30%	Pass	
Duplicate									
Eurofins Suite B11C: Na/K/Ca/Mg				Result 1	Result 2	RPD			
Calcium	B23-De0050247	CP	mg/L	80	85	5.8	30%	Pass	
Magnesium	B23-De0050247	CP	mg/L	210	220	5.1	30%	Pass	
Potassium	B23-De0050247	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Sodium	B23-De0050247	CP	mg/L	390	400	4.1	30%	Pass	

Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs) - Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	N23-De0050658	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)- Ultra Trace				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	N23-De0050658	NCP	ug/L	0.001	0.002	15	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	N23-De0050658	NCP	ug/L	0.0024	0.0028	7.8	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances- Ultra Trace				Result 1	Result 2	RPD			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	N23-De0050658	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	N23-De0050658	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	N23-De0050658	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	N23-De0050658	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	N23-De0050658	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	N23-De0050658	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
Perfluorooctane sulfonamide (FOSA)	N23-De0050658	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)- Ultra Trace				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	N23-De0050658	NCP	ug/L	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	N23-De0050658	NCP	ug/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25 °C)	B23-De0050250	CP	uS/cm	9300	9300	<1	30%	Pass	
pH (at 25 °C)	B23-De0050250	CP	pH Units	7.2	7.3	1.4	30%	Pass	
Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Bicarbonate Alkalinity (as CaCO3)	B23-De0050250	CP	mg/L	710	710	<1	30%	Pass	
Carbonate Alkalinity (as CaCO3)	B23-De0050250	CP	mg/L	< 20	< 20	<1	30%	Pass	
Hydroxide Alkalinity (as CaCO3)	B23-De0050250	CP	mg/L	< 20	< 20	<1	30%	Pass	
Total Alkalinity (as CaCO3)	B23-De0050250	CP	mg/L	710	710	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Jonathon Angell	Senior Analyst-Inorganic
Jonathon Angell	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-PFAS
Mary Makarios	Senior Analyst-Inorganic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date 05-Feb-24

Epic Environmental Pty Ltd
Level 6, 193 North Quay, Brisbane QLD 4000

Groundwater and Surface Water QC Sample Results & RPDs - PFAS

Sample Date	Laboratory Sample Number	Sample Number	Use	Notes	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)							Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)												Perfluoroalkyl Sulfonamides (µg/L)							Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)
					PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
Laboratory Level of Reporting (µg/L) - Standard Analysis					0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005
Laboratory Level of Reporting (µg/L) - TOPA					0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002
25-Oct-22	EB2232600006	NOTCH-V2	Surface Water	Standard	0.0126	0.0052	0.0406	<0.0016	0.0201	<0.0016	0.0607	<0.0080	0.0029	0.0029	0.0025	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0868
25-Oct-22	EB2232600038	BD01_2510	Surface Water	Standard	0.0120	0.0064	0.0356	<0.0016	0.0264	<0.0016	0.062	<0.0080	0.0026	0.0026	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0856
25-Oct-22	B22-No0014932	SD01_2510		Standard	0.0080	< 0.001	0.03	<0.0005	0.017	<0.0005	0.047	<0.0020	<0.0005	0.0030	<0.0005	0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.069
		Intra-Laboratory (Blind) Duplicate			5	21	13	NA	27	NA	2	NA	NA	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1
		Inter-Laboratory (Split) Duplicate			**45**	NA	**30**	NA	17	NA	25	NA	NA	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23
25-Oct-22	EB2232600005	NOTCH-V1	Surface Water	Standard	0.0121	0.0043	0.0238	<0.0016	0.0127	<0.0016	0.0365	<0.0079	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0529
25-Oct-22	EB2232600039	BD02_2510	Surface Water	Standard	0.0107	<0.0035	0.0209	<0.0016	<0.0148	<0.0016	0.0209	<0.0080	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0316
25-Oct-22	B22-No0014933	SD02_2510		Standard	0.0080	< 0.001	0.021	<0.0005	0.008	<0.0005	0.029	<0.0020	<0.0005	<0.0005	<0.0005	0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.047
		Intra-Laboratory (Blind) Duplicate			12	NA	13	NA	NA	NA	**54**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**50**
		Inter-Laboratory (Split) Duplicate			**41**	NA	13	NA	**45**	NA	23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12
27-Oct-22	EB2232600025	L005-B01	Groundwater	Standard	0.0025	0.0025	0.0281	0.0009	0.0720	<0.0005	0.1000	<0.0020	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.1070
27-Oct-22	EB2232600040	BD03_2710	Groundwater	Standard	0.0022	0.0029	0.027	0.0011	0.081	<0.0005	0.108	<0.0020	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.1150
27-Oct-22	B22-No0014934	SD03_2710		Standard	0.0020	0.002	0.023	<0.0005	0.067	<0.0005	0.09	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.094
		Intra-Laboratory (Blind) Duplicate			13	15	4	20	12	NA	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7
		Inter-Laboratory (Split) Duplicate			22	22	20	NA	7	NA	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13
29-Oct-22	EB2232600031	RN13030698	Groundwater	Standard	0.0033	0.0037	0.0436	0.0006	0.0053	<0.0005	0.0489	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0565
29-Oct-22	EB2232600041	BD04_2910	Groundwater	Standard	0.0032	0.0041	0.0409	0.0009	0.0057	<0.0005	0.0466	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0548
29-Oct-22	B22-No0014935	SD04_2910		Standard	0.0020	0.003	0.033	<0.0005	0.0018	<0.0005	0.0348	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0418
		Intra-Laboratory (Blind) Duplicate			3	10	6	**40**	7	NA	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3
		Inter-Laboratory (Split) Duplicate			**49**	21	28	NA	**99**	NA	**34**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30
02-Nov-22	EB2232870008	MW56	Groundwater	Standard	0.0518	0.0458	0.29	0.0224	0.7950	<0.0032	1.0800	<0.0160	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	1.2000
02-Nov-22	EB2232870001	BD05_0211	Groundwater	Standard	0.0515	0.0428	0.299	0.0227	0.868	<0.0032	1.17	<0.0160	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	1.2800
02-Nov-22	B22-No0021336	SD05_0211	Groundwater	Standard	0.0390	0.031	0.22	0.014	0.56	< 0.001	0.78	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.9090
		Intra-Laboratory (Blind) Duplicate			1	7	3	1	9	NA	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6
		Inter-Laboratory (Split) Duplicate			28	**39**	27	**46**	**35**	NA	**32**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28
02-Nov-22	EB2232870003	MW77	Groundwater	Standard	0.0039	<0.0015	0.0074	<0.0008	<0.0026	<0.0008	0.0074	<0.0040	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	0.0020	<0.001	<0.001	0.0133
02-Nov-22	EB2232870001	BD06_0211	Groundwater	Standard	0.0047	<0.0015	<0.0065	<0.0008	<0.0016	<0.0008	<0.0008	<0.0040	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	0.0010	<0.001	<0.001	0.0057
02-Nov-22	B22-No0021337	SD06_0211	Groundwater	Standard	0.0040	0.002	0.006	< 0.001	0.0011	< 0.001	0.0071	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0181
		Intra-Laboratory (Blind) Duplicate			19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**80**
		Inter-Laboratory (Split) Duplicate			3	NA	21	NA	NA	NA	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**31**
01-Mar-23	EB2306934013	RN13030698	Groundwater	Standard	0.0045	0.0042	0.0363	0.0005	0.0049	<0.0005	0.0412	<0.0040	<0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0504
01-Mar-23	EB2306934054	BD01_2902	Groundwater	Standard	0.0033	0.0037	0.0316	0.0006	0.006	<0.0005	0.0376	<0.0080	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0452
01-Mar-23	B23-Ma0034150	SD01_2902	Groundwater	Standard	0.0020	0.002	0.031	< 0.001	0.0033	< 0.001	0.0343	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.0010	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0413
		Intra-Laboratory (Blind) Duplicate			**31**	13	14	18	20	NA	9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11
		Inter-Laboratory (Split) Duplicate			**77**	**71**	16	NA	**39**	NA	18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20
02-Mar-23	EB2306934020	MW72	Groundwater	Standard	<0.0005	<0.0005	0.0018	<0.0005	0.0047	<0.0005	0.0065	<0.0079	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0065
02-Mar-23	EB2306934057	BD02_0203	Groundwater	Standard	<0.0005	<0.0005	0.0015	<0.0005	0.005	<0.0005	0.0065	<0.0079	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0065
02-Mar-23	B23-Ma0034151	SD02_0203	Groundwater	Standard	< 0.001	< 0.001	0.002	< 0.001	0.0035	< 0.001	0.0055	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0055
		Intra-Laboratory (Blind) Duplicate			NA	NA	18	NA	6	NA	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
		Inter-Laboratory (Split) Duplicate			NA	NA	11	NA	29	NA	17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17
03-Mar-23	EB2306934029	MW78	Groundwater	Standard	0.0182	0.0095	0.0447	<0.0015	0.0426	<0.0005	0.0873	<0.0077	<0.0015	<0.0015	<0.0015	<0.0005	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0038	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.1150
03-Mar-23	EB2306934058	BD03_0303	Groundwater	Standard	0.0188	0.0103	0.0512	<0.0020	0.0387	<0.0005	0.0899	<0.0078	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.002	0.1190
03-Mar-23	B23-Ma0034152	SD03_0303	Groundwater	Standard	0.0120	0.009	0.041	0.001	0.035	< 0.001	0.076	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.1100
		Intra-Laboratory (Blind) Duplicate			3	8	14	14	10	3	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3
		Inter-Laboratory (Split) Duplicate			**41**	5	9	NA	20	NA	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4
07-Mar-23	EB2306934046	MW70	Groundwater	Standard	0.0015	0.0011	0.0111	0.0006	0.0636	<0.0005	0.0747	<0.0080	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0016	<0.001	<0.001	<0.001	<0.001	0.0779
07-Mar-23	EB2306934059	BD04_0703	Groundwater	Standard	0.0016	0.0013	0.0138	<0.0010	0.0619	<0.0005	0.0757	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0786
07-Mar-23	B23-Ma0034153	SD04_0703	Groundwater	Standard	< 0.001	< 0.001	0.011	< 0.001	0.047	< 0.001	0.058	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0590
		Intra-Laboratory (Blind) Duplicate			6	17	22	NA	3	NA	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1
		Inter-Laboratory (Split) Duplicate			NA	NA	1	NA	**30**	NA	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28
08-Mar-23	EB2306934047	L012-B01	Groundwater	Standard	0.0018	0.0019	0.0177	0.0006	0.0180	<0.0005	0.0357	<0.0079	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0016	<0.001	<0.001	<0.001	<0.001	0.0400
08-Mar-23	EB2306934060	BD05_0803	Groundwater	Standard	0.0018	0.0018	0.0209	<0.0005	0.0147	<0.0005	0.0356	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0392
08-Mar-23	B23-Ma0034154	SD05_0803	Groundwater	Standard	0.0010	0.001	0.017	< 0.001	0.011	< 0.001	0.028	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0300
		Intra-Laboratory (Blind) Duplicate			0	5	17	17	20	NA	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2
		Inter-Laboratory (Split) Duplicate			**57**	**62**	4	NA	**48**	NA	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	29
09-Jun-23	EB2318365037	RN13030698	Groundwater	Standard	0.0038	0.0035	0.0352	<0.0005	0.0034	<0.0005	0.0386	<0.0079	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0459
09-Jun-23	EB2318365059	BD01_0906	Groundwater	Standard	0.0030	0.0031	0.032	0.0005	<0.0045	<0.0005	0.032	<0.0081	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0386
09-Jun-23	EB2318365064	SD01_0906	Groundwater	Standard	0.0028	0.0035	0.0312	<0.0005	<0.0044	<0.0005	0.0312	<0.0080	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0040	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0375
		Intra-Laboratory (Blind) Duplicate			24	12	10	NA	NA	NA	19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17
		Inter-Laboratory (Split) Duplicate			**30**	0	12	NA	NA	NA	21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20
10-Jun-23	EB2318365046	SW20	Surface Water	Standard	0.0029	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0078	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.001	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	0.0029
10-Jun-23	EB2318365060	BD02_1006	Surface Water	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0082	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
10-Jun-23	EB2318365065	SD02_1006	Surface Water	Standard	<0.0016	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0080	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
		Intra-Laboratory (Blind) Duplicate			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	#VALUE!
		Inter-Laboratory (Split) Duplicate			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	#VALUE!
10-Jun-23	EB2318365038	RN13030715	Groundwater	Standard	0.0017	0.001	0.0048	<0.0005	<0.0002	<0.0005	0.0048	<0.0080	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0075
10-Jun-23	EB2318365061	BD03_1006	Groundwater	Standard	0.0015	0.001	0.0046	<0.0005	<0.0002	<0.0005	0.0046	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0071
10-Jun-23	EB2318365066	SD03_1006	Groundwater	Standard	0.0015	0.0012	0.0051	<0.0005	<0.0002	<0.0005	0.0051	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0078
		Intra-Laboratory (Blind) Duplicate			13	0	4	NA	NA	NA	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5
		Inter-Laboratory (Split) Duplicate			13	18	6	NA	NA	NA	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4
12-Jun-23	EB2318365007	L021-B01	Groundwater	Standard	0.0008	0.0011	0.0124	<0.0005	0.0456	<0.0005	0.0580	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0599
12-Jun-23	EB2318365062	BD04_1206	Water	Standard	0.0008	0.0011	0.014	<0.0005	0.0366	<0.0005	0.0506	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0525
12-Jun-23	EB2318365067	SD04_1206	Water	Standard	<0.0006	0.0012	0.0129	<0.0005	0.0476	<0.0005	0.0605	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0617
		Intra-Laboratory (Blind) Duplicate			0	0	12	0	NA	22	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13
		Inter-Laboratory (Split) Duplicate			NA	9	4	NA	4	NA	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3
14-Jun-23	EB2318365006	L012-B01	Groundwater	Standard	0.0015	0.0014	0.0165	0.0005	0.0092	<0.0005	0.0257	<0.0079	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.004	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0291
14-Jun-23	EB2318365063	BD05_1406	Groundwater	Standard	0.0014	<0.0011	0.0146	<0.0008	0.0112	<0.0005	0.0258	<0.0080	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date 05-Feb-24

Epic Environmental Pty Ltd
Level 6, 193 North Quay, Brisbane QLD 4000

Groundwater and Surface Water QC Sample Results & RPDs - PFAS

Sample Date	Laboratory Sample Number	Sample Number	Use	Notes	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)							Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)											Perfluoroalkyl Sulfonamides (µg/L)							Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)
					PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
Laboratory Level of Reporting (µg/L) - Standard Analysis					0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005
Laboratory Level of Reporting (µg/L)) - TOPA					0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002
Field Blanks																																		
20-Feb-21	EB2104890009	FB_2002	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
20/02/2021	EB2104890009	FB_2002	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
18-May-21	EB2114060008	FB_1805	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
20-May-21	EB2114060035	FB_2005	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
07-Jul-21	EB2119293011	FB_0707	Field Blank	Standard	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
20-Oct-21	EB2130810015	FB_2010	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
23-Oct-21	EB2130810016	FB_2310	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
15-Dec-21	EB2137227003	FB_1512	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
19-Jan-22	EB2202169016	FB_1901	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
18-Jan-22	EB2202169006	FB_1801	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
01-Apr-22	EB2209243032	FB_0104	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
02-Apr-22	EB2209243043	FB_0204	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
03-Apr-22	EB2209243049	FB_0304	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
29-Mar-22	EB2209243010	FB_2903	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
30-Mar-22	EB2209243013	FB_3003	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
05-Apr-22	EB2209861015	FB_0504	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
06-Apr-22	EB2209861017	FB_0604	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
07-Apr-22	EB2209861019	FB_0704	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
09-Jun-22	EB2216789013	FB_0906	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
10-Jun-22	EB2216789015	FB_1006	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
08-Jun-22	EB2216789002	FB_0806	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
07-Jul-22	EB2220051048	FB_0707	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
08-Jul-22	EB2220051052	FB_0807	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
09-Jul-22	EB2220051054	FB_0907	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
10-Jun-22	EB2220051056	FB_1007	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
13-Jul-22	EB2220736024	RB01_1307	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
14-Jul-22	EB2220736025	RB_1407	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
02-Nov-22	EB2232870001	RB_0211	Rinsate	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
04-Nov-22	EB2232870001	RB_0411	Rinsate	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
27-Oct-22	EB2232600042	RB_2710	Rinsate	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
28-Oct-22	EB2232600043	RB_2810	Rinsate	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
29-Oct-22	EB2232600044	RB_2910	Rinsate	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
02-Mar-23	EB2306934052	RB01_0203	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
03-Mar-23	EB2306934053	RB01_0303	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
04-Mar-23	EB2306934054	RB01_0403	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
07-Mar-23	EB2306934055	RB01_0703	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.004	<0.004	<0.004	<0.004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
07-Jun-23	EB2318365051	RB01_0706	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
09-Jun-23	EB2318365052	RB01_0906	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
12-Jun-23	EB2318365053	RB01_1206	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
13-Jun-23	EB2318365054	RB01_1306	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
05-Sep-23	EB2328001045	RB01_0509	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
06-Sep-23	EB2328001046	RB01_0609	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
07-Sep-23	EB2328001047	RB01_0709	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
05-Dec-23	EB2339753050	RB01_0512	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
07-Dec-23	EB2339753051	RB01_0712	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
09-Dec-23	EB2339753052	RB01_0912	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
11-Dec-23	EB2339753053	FB01_1112	Field Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
Rinstae Blanks																																		
04-Nov-20	EB2029263010	RB01	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
20-Jan-21	EB2101853021	RB01	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
21-Jan-21	EB2101853022	RB02	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
20-Feb-21	EB2104890020	RB_2002	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
20-Feb-21	EB2104890020	RB_2002	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
08-Apr-21	EB2109607016	RB01	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
18-May-21	EB2114060009	RB_1805	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
28-May-21	EB2115500012	RB_2805	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
19-Oct-21	EB2130810040	RB_1910	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
22-Oct-21	EB2130810041	RB_2210	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
15-Dec-21	EB2137227004	RB_1512	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
19-Jan-22	EB2202169017	RB_1901	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
24-Jan-22	EB2202169055	RB_2401	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
01-Apr-22	EB2209243033	RB_0104	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002
02-Apr-22	EB2209243042	RB_0204	Rinsate Blank	Standard	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0020	<0.0005	<0.0005

Epic File: BC200153.01
Site: Callide Power Station
Client: CS Energy
Report Date 05-Feb-24

Epic Environmental Pty Ltd
Level 6, 193 North Quay, Brisbane QLD 4000

Groundwater QC Sample Results & RPDs - Physico-Chemical, Cations & Anions

Sample Date	Laboratory Sample Number	Sample Duplicate	Sample Number	Material Type	Physico-Chemical Parameters				Total Metals (mg/L)		Nutrients (mg/L)									Cations and Anions (mg/L)							
					pH	Specific Conductance (µS/cm)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Manganese	Iron	Ammonia as N	Nitrite as N	Nitrate as N	Nitrite + Nitrate as N	Reactive P	Chloride	Sulfate as SO_4	Hydroxide Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Calcium	Magnesium	Sodium	Potassium	Fluoride	Total Anions (meq/L)	Total Cations (meq/L)	Ionic Balance (%)
Laboratory Level of Reporting					**0.01**	**1**	**10**	**1**	**0.001**	**0.05**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0.1**	**0.01**	**0.01**	**0.01**
25-Oct-22	EB2232600005	Parent Sample	NOTCH-V1	Surface Water	8.03	19,200	13,400	<5	0.147	0.07	0.07	<0.01	<0.01	<0.01	<0.01	5,370	2,430	<1	<1	424	424	555	856	2,620	2	0.2	210	212	0.38
25-Oct-22	EB2232600038	Blind Duplicate	BD01_2510	Surface Water	8.24	17,000	12,500	<5	0.076	0.06	0.03	<0.01	<0.01	<0.01	<0.01	4,760	2,210	<1	<1	429	429	465	738	2,450	2	0.2	189	190	0.45
25-Oct-22	B22-No0014932	Split Duplicate	SD01_2510	Surface Water	8	18,000	12,000	11			< 0.01	< 0.02	< 0.02	< 0.02	0.05	5,000	2,300	< 20	< 10	480	480	490	770	2,600	< 5	-	-	-	-
		Intra-Laboratory (Blind) Duplicate			3	12	7	NA	**64**	15	**80**	NA	NA	NA	NA	12	7	9	NA	NA	1	1	18	15	7	0	0	11	11	17
		Inter-Laboratory (Split) Duplicate			0	6	11	NA	**200**	**200**	NA	NA	NA	NA	NA	7	5	NA	NA	12	12	12	11	1	NA	NA	NA	NA	NA
25-Oct-22	EB2232600006	Parent Sample	NOTCH-V2	Surface Water	8.22	18,400	12,200	<5	0.071	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	4,900	2,180	<1	<1	428	428	462	746	2,440	2	0.2	192	191	0.4
25-Oct-22	EB2232600039	Blind Duplicate	BD02_2510	Surface Water	7.95	18,800	13,800	<5	0.149	0.08	0.08	<0.01	<0.01	<0.01	<0.01	5,440	2,460	<1	<1	423	423	566	864	2,620	2	0.2	213	213	0.06
25-Oct-22	B22-No0014933	Split Duplicate	SD02_2510	Surface Water	7.9	22,000	15,000	7			0.01	< 0.02	< 0.02	< 0.02	0.07	5,700	2,500	< 20	< 10	470	470	620	900	2,800	< 5	-	-	-	-
		Intra-Laboratory (Blind) Duplicate			3	2	12	NA	**71**	NA	**120**	NA	NA	NA	NA	10	12	NA	NA	1	1	20	15	7	0	0	10	11	**148**
		Inter-Laboratory (Split) Duplicate			4	18	21	NA	**200**	NA	**67**	NA	NA	NA	NA	15	14	NA	NA	9	9	29	19	14	NA	NA	NA	NA	NA
27-Oct-22	EB2232600025	Parent Sample	L005-B01	Groundwater	8.11	1,760	975	<5	<0.001	<0.05	0.13	<0.01	0.74	0.74	0.01	352	60	<1	<1	320	320	94	48	228	2	0.1	17.6	18.6	2.87
27-Oct-22	EB2232600040	Blind Duplicate	BD03_2710	Groundwater	8.12	1,760	996	<5	<0.001	<0.05	0.02	<0.01	0.72	0.72	0.01	352	60	<1	<1	316	316	95	47	220	2	0.2	17.5	18.2	2.06
27-Oct-22	B22-No0014934	Split Duplicate	SD03_2710	Groundwater	7.9	1,700	1,200	< 5			< 0.01	< 0.02	0.89	0.89	0.04	360	58	< 20	< 10	380	380	94	41	210	2.4	-	-	-	-
		Intra-Laboratory (Blind) Duplicate			0	0	2	NA	NA	NA	**147**	NA	3	3	0	0	NA	NA	NA	1	1	1	2	4	0	**67**	1	2	**33**
		Inter-Laboratory (Split) Duplicate			3	3	21	NA	NA	NA	NA	NA	18	18	**120**	2	3	NA	NA	17	17	0	16	8	18	NA	NA	NA	NA
29-Oct-22	EB2232600031	Parent Sample	RN13030698	Groundwater	8	2,050	1,320	<5	0.002	<0.05	<0.01	<0.01	8.52	8.52	0.02	470	43	<1	<1	318	318	143	75	189	2	0.2	20.5	21.6	2.55
29-Oct-22	EB2232600041	Blind Duplicate	BD04_2910	Groundwater	7.25	2,050	1,400	<5	0.001	<0.05	0.03	<0.01	8.59	8.59	0.02	468	43	<1	<1	314	314	146	70	178	2	0.2	20.4	20.8	1.14
29-Oct-22	B22-No0014935	Split Duplicate	SD04_2910	Groundwater	7.3	1,900	1,400	< 5			< 0.01	< 0.02	9.90	9.90	0.08	470	40	< 20	< 10	330	330	140	67	170	1.6	-	-	-	-
		Intra-Laboratory (Blind) Duplicate			10	0	6	NA	**67**	NA	NA	NA	1	1	0	0	0	NA	NA	1	1	2	1	6	0	0	0	4	**76**
		Inter-Laboratory (Split) Duplicate			9	8	6	NA	**200**	NA	NA	NA	15	15	**120**	0	7	NA	NA	4	4	2	11	11	22	NA	NA	NA	NA
02-Nov-22	EB2232870001	Parent Sample	MW56	Groundwater	7.55	10,500	6,630	<1	0.002	<0.05	<0.01	<0.01	<0.01	<0.01	0.02	3,140	731	<1	<1	702	702	261	346	1,300	<1	0.3	118	98	9.16
02-Nov-22	EB2232870001	Blind Duplicate	BD05_0211	Groundwater	7.62	10,300	6,540	<1	0.002	<0.05	<0.01	<0.01	<0.01	<0.01	0.03	3,170	706	<1	<1	704	704	266	360	1,340	<1	0.3	118	101	7.75
02-Nov-22	B22-No0021336	Split Duplicate	SD05_0211	Groundwater	8	8,500	6,900	< 5	-	-	< 0.01	< 0.02	< 0.02	-	0.08	2,700	630	< 20	< 10	790	790	210	400	1,400	1.3	-	-	-	-
		Intra-Laboratory (Blind) Duplicate			1	2	1	NA	0	NA	NA	NA	NA	NA	**40**	1	3	NA	NA	0	0	2	4	3	NA	0	0	3	17
		Inter-Laboratory (Split) Duplicate			6	21	4	NA	NA	NA	NA	NA	NA	NA	**120**	15	15	NA	NA	12	12	22	14	7	NA	NA	NA	NA	NA
02-Nov-22	EB2232870001	Parent Sample	MW77	Groundwater	7.27	13,900	9,720	2	0.542	<0.05	0.13	<0.01	<0.01	<0.01	0.02	4,260	1,630	<1	<1	645	645	376	576	1,680	2	0.3	167	139	9.04
02-Nov-22	EB2232870001	Blind Duplicate	BD06_0211	Groundwater	7.42	14,600	9,260	<1	0.511	<0.05	0.12	<0.01	<0.01	<0.01	0.03	4,300	1,550	<1	<1	647	647	382	574	1,670	3	0.3	166	139	8.99
02-Nov-22	B22-No0021337	Split Duplicate	SD06_0211	Groundwater	7	10,000	6,400	15	-	-	0.13	< 0.02	< 0.02	-	0.09	4,400	1,600	< 20	< 10	680	680	430	700	1,900	3.4	-	-	-	-
		Intra-Laboratory (Blind) Duplicate			2	5	5	NA	6	NA	8	NA	NA	NA	**40**	1	5	NA	NA	0	0	2	0	1	**40**	0	1	0	1
		Inter-Laboratory (Split) Duplicate			4	**33**	**41**	**153**	NA	NA	0	NA	NA	NA	**127**	3	2	NA	NA	5	5	13	19	12	**52**	NA	NA	NA	NA
01-Mar-23	EB2306934013	Parent Sample	RN13030698	Groundwater	7.88	2,330	1,800	<1	0.002	<0.05	<0.01	<0.01	11.70	11.70	0.03	566	40	<1	<1	268	268	157	82	160	2	0.1	22.2	21.6	1.28
01-Mar-23	EB2306934056	Blind Duplicate	BD01 2902	Groundwater	7.92	2,310	1,860	<1	<0.001	<0.05	0.01	<0.01	11.60	11.60	0.02	565	40	<1	<1	271	271	162	80	192	2	0.1	22.2	23.1	1.96
01-Mar-23	B23-Ma0034150	Split Duplicate	SD01_2902	Groundwater	7.1	2,400	1,300	< 5	< 0.005	< 0.05	< 0.01	-	-	11.00	0.05	510	43	< 20	< 20	310	310	160	85	190	1.7	-	21.5	23.3	4
		Intra-Laboratory (Blind) Duplicate			1	1	3	NA	NA	NA	NA	NA	1	1	**40**	0	0	NA	NA	1	1	3	2	18	0	0	0	7	**42**
		Inter-Laboratory (Split) Duplicate			10	3	**32**	NA	NA	NA	NA	NA	NA	NA	6	**50**	10	7	NA	NA	15	15	2	2	4	17	16	NA	3	8	**103**
02-Mar-23	EB2306934020	Parent Sample	MW72	Groundwater	7.98	908	567	<1	0.995	0.79	0.03	<0.01	<0.01	<0.01	0.01	158	47	<1	<1	178	178	66	34	67	6	0.1	8.99	9.16	0.92
02-Mar-23	EB2306934057	Blind Duplicate	BD02_0203	Groundwater	8.06	908	574	<1	0.782	<0.05	0.04	<0.01	<0.01	<0.01	0.01	156	48	<1	<1	180	180	62	31	74	5	0.1	9	8.99	0.02
02-Mar-23	B23-Ma0034151	Split Duplicate	SD02_0203	Groundwater	7.2	950	520	< 5	0.640	< 0.05	< 0.01	-	-	< 0.05	0.03	140	54	< 20	< 20	200	200	59	32	69	4.3	-	9.1	8.7	-2
		Intra-Laboratory (Blind) Duplicate			1	0	1	NA	24	NA	29	NA	NA	NA	0	1	2	NA	NA	1	1	6	9	10	18	0	0	2	**191**
		Inter-Laboratory (Split) Duplicate			10	5	9	NA	**43**	NA	NA	NA	NA	NA	**100**	12	14	NA	NA	12	12	11	6	3	**33**	NA	1	5	**541**
03-Mar-23	EB2306934029	Parent Sample	MW78	Groundwater	8.13	11,300	7,750	6	0.069	<0.05	<0.01	<0.01	<0.01	<0.01	0.01	2,790	1,470	<1	<1	570	570	108	343	1,990	3	1.1	121	120	0.18
03-Mar-23	EB2306934058	Blind Duplicate	BD03_0303	Groundwater	8.19	11,300	7,640	<1	0.054	<0.05	<0.01	<0.01	<0.01	<0.01	0.01	2,780	1,470	<1	<1	572	572	105	312	2,130	1	1	120	124	1.28
03-Mar-23	B23-Ma0034152	Split Duplicate	SD03_0303	Groundwater	7.5	12,000	7,000	< 5	0.053	< 0.05	< 0.01	-	-	< 0.05	0.05	2,500	1,800	< 20	< 20	670	670	100	330	2,100	1.3	-	121.3	123.5	0.9
		Intra-Laboratory (Blind) Duplicate			1	0	1	NA	24	NA	NA	NA	NA	NA	0	0	0	NA	NA	0	0	3	9	7	**100**	10	1	3	**151**
		Inter-Laboratory (Split) Duplicate			8	6	10	NA	26	NA	NA	NA	NA	NA	**133**	11	20	NA	NA	16	16	8	4	5	**79**	NA	0	3	**133**
07-Mar-23	EB2306934046	Parent Sample	MW70	Groundwater	8	833	533	<1	0.204	0.09	0.02	<0.01	<0.01	<0.01	<0.01	137	41	<1	<1	172	172	58	29	69	2	0.1	8.15	8.33	1.08
07-Mar-23	EB2306934059	Blind Duplicate	BD04 0703	Groundwater	8.04	839	553	1	0.213	0.13	0.02	<0.01	<0.01	<0.01	<0.01	137	41	<1	<1	173	173	58	30	71	2	0.1	8.17	8.5	1.97
07-Mar-23	B23-Ma0034153	Split Duplicate	SD04_0703	Groundwater	7.2	880	470	< 5	0.170	< 0.05	0.03	-	-	< 0.05	0.02	120	46	< 20	< 20	200	200	54	29	64	2	-	8.3	7.9	-2.6
		Intra-Laboratory (Blind) Duplicate			0	1	4	NA	4	**36**	0	NA	NA	NA	NA	0	0	NA	NA	**38**	1	1	0	3	3	0	0	2	**58**
		Inter-Laboratory (Split) Duplicate			11	5	13	NA	18	NA	**40**	NA	NA	NA	NA	13	11	NA	NA	15	15	7	0	8	0	NA	2	5	**484**
08-Mar-23	EB2306934040	Parent Sample	L021-B01	Groundwater	8.02	522	293	<1	<0.001	<0.05	<0.01	<0.01	0.18	0.18	0.01	80	8	<1	<1	124	124	30	15	47	1	0.1	4.9	4.8	1.02
08-Mar-23	EB2306934060	Blind Duplicate	BD05_0803	Groundwater	7.94	1,360	1,050	<1	0.009	<0.05	0.03	<0.01	<0.01	<0.01	<0.01	303	86	<1	<1	160	160	97	50	102	2	0.1	13.9	13.4	0.34
08-Mar-23	B23-Ma0034154	Split Duplicate	SD05_0803	Groundwater	7	1,400	810	< 5	0.008	< 0.05	< 0.01	-	-	< 0.05	0.03	220	100	< 20	< 20	190	190	94	51	99	1.5	-	12.1	13.2	4.5
		Intra-Laboratory (Blind) Duplicate			1	**89**	**113**	NA	NA	NA	NA	NA	NA	NA	NA	**116**	**166**	NA	NA	25	25	**106**	**108**	**74**	**67**	0	**93**	**95**	**100**
		Inter-Laboratory (Split) Duplicate			14	**91**	**94**	NA	NA	NA	NA	NA	NA	NA	**100**	**93**	**170**	NA	NA	**42**	**42**	**103**	**109**	**71**	**40**	NA	**85**	**93**	**126**
09-Jun-23	EB2318365037	Parent Sample	RN13030698	Groundwater	7.14	2,320	1,700	<1	<0.001	<0.05	<0.01	<0.01	10.90	10.90	0.03	656	42	<1	<1	301	301	189	84	197	2	0.1	25.4	25	0.85
09-Jun-23	EB2318365059	Blind Duplicate	BD01_0906	Groundwater	7.45	2,480	1,710	<1	<0.001	<0.05	<0.01	<0.01	11.00	11.00	0.03	653	43	<1	<1	291	291	186	82	191	2	0.1	25.1	24.4	1.49
09-Jun-23	EB2318365064	Split Duplicate	SD01_0906	Groundwater	7.17	2,430	1,770	<1	0.002	<0.05	<0.01	<0.01	11.20	11.20	0.03	651	44	<1	<1	297	297	186	85	195	2	0.1	25.2	24.8	0.81
		Intra-Laboratory (Blind) Duplicate			4	7	1	NA	NA	NA	NA	NA	1	1	0	0	2	NA	NA	3	3	2	2	3	0	0	1	2	**55**
		Inter-Laboratory (Split) Duplicate			0	5	4	NA	NA	NA	NA	NA	3	3	0	1	5	NA	NA	1	1	2	1	1	0	0	1	1	5
10-Jun-23	EB2318365046	Parent Sample	SW20	Surface Water	8.11	430	272	16	0.076	0.25	<0.01	<0.01	<0.01	<0.01	<0.01	48	5	<1	<1	138	138	27	15	35	4	0.2	4.22	4.21	0.1
10-Jun-23	EB2318365060	Blind Duplicate	BD02_1006	Surface Water	8.27	425	276	10	0.070	0.17	<0.01	<0.01	<0.01	<0.01	<0.01	54	8	<1	<1	138	138	29	16	37	4	0.2	4.45	4.48	0.32
10-Jun-23	EB2318365065	Split Duplicate	SD02_1006	Surface Water	8.37	418	279	12	0.077	0.19	<0.01	<0.01	<0.01	<0.01	<0.01	54	6	<1	<1	140	140	29	15	37	4	0.2	4.44	4.39	0.59
		Intra-Laboratory (Blind) Duplicate			2	1	1	**46**	8	**38**	NA	NA	NA	NA	**46**	NA	NA	NA	NA	0	0	7	6	6	0	0	0	6	**105**
		Inter-Laboratory (Split) Duplicate			3	3	3	29	1	27	NA	NA	NA	NA	18	NA	NA	NA	NA	1	1	7	0	6	0	0	5	4	**142**
10-Jun-23	EB2318365038	Parent Sample	RN13030715	Groundwater	7.87	2,850	1,900	<1	<0.001	<0.05	<0.01	<0.01	4.45	4.45	0.10	757	57	<1	<1	314	314	159	85	299	1	0.2	28.8	28	1.5
10-Jun-23	EB2318365061	Blind Duplicate	BD03_1006	Groundwater	7.61	2,750	1,910	<1	0.001	<0.05	<0.01	<0.01	4.46	4.46	0.09	746	63	<1	<1	314	314	157	82	299	1	0.2	28.6	27.6	1.8
10-Jun-23	EB2318365066	Split Duplicate	SD03_1006	Groundwater	8.15	2,760	1,920	<1	<0.001	<0.05	<0.01	<0.01	4.08	4.08	0.09	753	59	<1	<1	319	319	156	83	297	1	0.2	28.8	27.6	2.28
		Intra-Laboratory (Blind) Duplicate			3	4	1	NA	NA	NA	NA	NA	0	0	11	1	10	NA	NA	0	0	1	4	0	0	0	1	1	18
		Inter-Laboratory (Split) Duplicate			3	3	1	NA	NA	NA	NA	NA	9	9	11	1	3	NA	NA	2	2	2	1	0	0	0	1	1	**41**
12-Jun-23	EB2318365007	Parent Sample	L021-B01	Groundwater	7.44	600	344	<1	<0.001	<0.05	0.01	<0.01	0.23	0.23	0.01	104	7	<1	<1	133	133	35	18	60	1	0.1	5.74	5.86	1.09
12-Jun-23	EB2318365062	Blind Duplicate	BD04_1206	Groundwater	7.49	566	347	<1	0.002	0.08	<0.01	<0.01	0.23	0.23	<0.01	108	8	<1	<1	132	132	35	16	58	1	0.1	5.85	5.61	2.08
12-Jun-23	EB2318365067	Split Duplicate	SD04_1206	Groundwater	7.87	573	350	<1	<0.001	<0.05	<0.01	<0.01	0.23	0.23	<0.01	105	8	<1	<1	134	134	35	16	57	<1	0.1	5.8	5.54	2.32
		Intra-Laboratory (Blind) Duplicate			1	6	1	NA	NA	NA	NA	NA	0	0	NA	4	13	NA	NA	1	1	0	12	3	4	0	2	4	**62**
		Inter-Laboratory (Split) Duplicate			6	5	2	NA	NA	NA	NA	NA	0	0	NA	1	13	NA	NA	1	1	0	12	5	NA	0	1	6	**72**
14-Jun-23	EB2318365006	Parent Sample	L012-B01	Groundwater	7.18	1,360	972	<1	0.008	<0.05	0.02	<0.01	<0.01	<0.01	0.01	302	85	<1	<1	172	172	101	50	100	2	0.1	13.7	13.6	0.62
14-Jun-23	EB2318365063	Blind Duplicate	BD05_1406	Groundwater	7.69	1,290	965	2	0.008	<0.05	<0.01	<0.01	11.10	11.10	0.01	302	90	<1	<1	177	177	102	48	99	2	0.1	13.9	13.4	2.04
14-Jun-23	EB2318365068	Split Duplicate	SD05_1406	Groundwater	7.05	1,290	986	<1	0.008	<0.05	<0.01	<0.01	<0.01	<0.01	0.01	303	92	<1	<1	174	174	100	47	100	2	0.1	13.9	13.2	2.5
		Intra-Laboratory (Blind) Duplicate			7	5	1	NA	0	NA	NA	NA	NA	NA	0	0	6	NA	NA	3	3	1	4	1	**67**	0	1	1	**107**
		Inter-Laboratory (Split) Duplicate			2	5	1	NA	0	NA	NA	NA	0	0	8	NA	NA	NA	NA	1	1	1	6	0	0	0	1	3	**121**
04-Sep-23	EB2328001015	Parent Sample	MW72	Groundwater	8.13	831	508	<5	0.036	<0.05	<0.01	<0.01	<0.01	<0.01	0.01	132	50	<1	<1	158	158	58	29	68	4	0.1	7.92	8.34	2.58
05-Sep-23	EB2328001041	Blind Duplicate	BD01_0509	Groundwater	7.9	799	486	<5	0.035	<0.05	0.01	<0.01	0.01	0.01	0.01	146	48	<1	<1	168	168	58	30	68	4	0.1	8.47	8.42	0.3
05-Sep-23	B23-Se0033665	Split Duplicate	SD01_0509	Groundwater	7.3	890	530	< 5	0.025	< 0.05	< 0.01	< 0.02	0.27	-	0.02	140	48	< 20	< 20	180	180	57	28	68	4.8	-	8.5	8.2	-1.9
		Intra-Laboratory (Blind) Duplicate			3	4	4	NA	3	NA	NA	NA	NA	NA	0	10	4	NA	NA	6	6	0	3	0	0	0	7	1	**158**
		Inter-Laboratory (Split) Duplicate			11	7	4	NA	**36**	NA	NA	NA	NA	NA	**67**	6	4	NA	NA	13	13	2	4	0	18	NA	7	2	**1318**
07-Sep-23	EB2328001008	Parent Sample	MW32	Groundwater	7.88	7,060	5,000	<5	0.826	0.15	0.03	<0.01	<0.01	<0.01	0.01	1,590	998	<1	<1	399	399	402	436	242	<1	0.6	72.9	66.5	4.64
07-Sep-23	EB2328001042	Blind Duplicate	BD02_0709	Groundwater	7.69	6,830	4,860	<5	0.796	0.20	0.13	<0.01	<0.01	<0.01	<0.01	1,720	936	<1	<1	486	486	522	587	323	<1	0.6	77.7	88.4	6.44
07-Sep-23	B23-Se0033666	Split Duplicate	SD02_0709	Groundwater	7.1	7,000	5,000	38	0.650	0.07	0.38	< 0.02	< 0.02	-	< 0.01	1,900	4,600	< 20	< 20	510	510	520	500	310	0.9	-	159.5	80.6	-32.8
		Intra-Laboratory (Blind) Duplicate			2	3	3	NA	4	29	**125**	NA	NA	NA	NA	8	3	NA	NA	20	20	26	30	29	NA	0	6	28	**32**
		Inter-Laboratory (Split) Duplicate			10	1	0	NA	24	**73**	**171**	NA	NA	NA	NA	18	**131**	NA	NA	24	24	26	14	25	NA	NA	**75**	19	**266**
07-Sep-23	EB2328001032	Parent Sample	RN13030126	Groundwater	7.94	610	400	<5	0.002	<0.05	0.02	<0.01	0.07	0.07	0.03	109	16	<1	<1	146	146	35	17	46	1	0.1	6.32	5.17	10
07-Sep-23	EB2328001043	Blind Duplicate	BD03_0709	Groundwater	7.26	600	346	<5	0.002	<0.05	<0.01	<0.01	0.07	0.07	0.02	96	16	<1	<1	137	137	40	19	56	1	0.1	5.78	6.02	2.06
07-Sep-23	B23-Se0033667	Split Duplicate	SD03_0709	Groundwater	7.2	710	120	< 5	< 0.005	< 0.05	0.39	< 0.02	0.30	-	0.03	100	3,400	< 20	< 20	150	150	42	19	55	1.6	-	76.5	6.1	-85.3
		Intra-Laboratory (Blind) Duplicate			9	2	14	NA	0	NA	NA	NA	0	0	**40**	13	0	NA	NA	6	6	13	11	20	0	0	9	15	**132**
		Inter-Laboratory (Split) Duplicate			10	15	**108**	NA	NA	NA	**180**	NA	**124**	**200**	0	9	**198**	NA	NA	3	3	18	11	18	**46**	NA	**169**	17	**253**
07-Sep-23	EB2328001006	Parent Sample	L021-B01	Groundwater	7.24	630	410	<5	<0.001	<0.05	<0.01	<0.01	0.28	0.28	0.01	120	9	<1	<1	125	125	41	21	65	1	0.1	6.07	6.63	4.39
07-Sep-23	EB2328001044	Blind Duplicate	BD04_0709	Groundwater	7.48	640	358	<5	<0.001	<0.05	<0.01	<0.01	0.28	0.28	0.01	119	9	<1	<1	126	126	38	18	61	1	0.1	6.06	6.06	0.04
07-Sep-23	B23-Se0033668	Split Duplicate	SD04_0709	Groundwater	7.3	710	390	< 5	< 0.005	< 0.05	0.38	< 0.02	0.32	-	0.02	120	3,700	< 20	< 20	140	140	40	18	60	1.3	-	83.1	6.1	-86.3
		Intra-Laboratory (Blind) Duplicate			3	2	14	NA	NA	NA	NA	NA	0	0	1	1	0	NA	NA	1	1	8	15	6	0	0	0	9	**196**
		Inter-Laboratory (Split) Duplicate			1	12	5	NA	NA	NA	NA	NA	13	**200**	**67**	0	**199**	NA	NA	11	11	2	15	8	26	NA	**173**	8	**221**
08-Dec-23	EB2339753018	Parent Sample	MW31	Groundwater	7.87	5,290	3,760	3	0.232	0.07	0.01	<0.01	0.06	0.06	0.04	1,320	21	<1	<1	574	574	59	284	510	<1	0.8	49.1	48.5	0.65
08-Dec-23	EB2339753058	Blind Duplicate	BD01_0812	Groundwater	8.08	5,190	3,930	1	0.246	0.10	0.05	<0.01	0.10	0.10	0.04	1,330	21	<1	<1	575	575	109	271	515	<1	0.8	49.4	50.1	0.7
08-Dec-23	B23-De0050247	Split Duplicate	SD01_0812	Groundwater	7.5	5,200	3,100	14	0.19	0.09	0.24	-	-	0.07	0.08	1,500	19	<20	<20	630	630	80	210	390	<0.5	-	-	-	-18.2
		Intra-Laboratory (Blind) Duplicate

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date 05-Feb-24

Epic Environmental Pty Ltd
Level 17, 95. North Quay, Brisbane QLD 4000

Sediment QC Sample Results & RPDs

Sample Date	Laboratory Sample Number	Sample Number	Material Type	Analysis	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg)											Perfluoroalkyl Sulfonamides (mg/kg)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg)				Total PFAS (mg/kg)
					PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
Laboratory Level of Reporting (µg/L)) - Standard Analysis					0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005
Laboratory Level of Reporting (µg/L)) - TOPA					0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002
09-Jun-22	EB2216772035	AD4-2	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	0.004	<0.0008	<0.0005	<0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.004
09-Jun-22	EB2216772038	BD04_0906	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	**0.004**	<0.0009	<0.0006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.004**
09-Jun-22	B22-Jn0039104	SD04_0906	Sediment	Standard	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005
Intra-Laboratory (Blind) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inter-Laboratory (Split) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09-Jun-22	EB2216772034	AD4-1	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	0.0016	<0.0002	0.0016	0.003	<0.0003	0.0006	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0055
09-Jun-22	EB2216772040	BD06_0906	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	<0.0019	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
09-Jun-22	B22-Jn0039105	SD05_0906	Sediment	Standard	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005
Intra-Laboratory (Blind) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inter-Laboratory (Split) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09-Jun-22	EB2216772037	AD4-4	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	<0.0036	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
09-Jun-22	EB2216772040	BD06_0906	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	<0.0019	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
09-Jun-22	B22-Jn0039106	SD06_0906	Sediment	Standard	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005
Intra-Laboratory (Blind) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inter-Laboratory (Split) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07-Jun-22	EB2216772014	ESCT1	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0020**	<0.0002	**0.002**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.002**
07-Jun-22	EB2216772009	BD03_0706	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0019**	<0.0002	**0.0019**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0019**
07-Jun-22	B22-Jn0039102	SD03_0706	Sediment	Standard	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005
Intra-Laboratory (Blind) Duplicate					N/A	N/A	N/A	N/A	5	N/A	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5
Inter-Laboratory (Split) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06-Jun-22	EB2216772002	BS3	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
06-Jun-22	EB2216772001	BD01_0606	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
06-Jun-22	B22-Jn0039100	SD01_0606	Sediment	Standard	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005
Intra-Laboratory (Blind) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inter-Laboratory (Split) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07-Jun-22	EB2216772018	Notch-V2-0.1	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	<0.0016	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
07-Jun-22	EB2216772008	BD02_0706	Sediment	Standard	<0.0002	<0.0002	**0.0002**	<0.0002	<0.0012	<0.0002	**0.0002**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0002**
07-Jun-22	B22-Jn0039101	SD02_0706	Sediment	Standard	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005
Intra-Laboratory (Blind) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Inter-Laboratory (Split) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
14-Sep-22	EB2227515014	SPC-SP-14	Sediment	Standard	<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002	**0.0002**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0002**
14-Sep-22	EB2227515015	BD01_1409	Sediment	Standard	<0.0002	<0.0002	**0.0005**	<0.0002	**0.0013**	<0.0002	**0.0018**	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0001	<0.0005	<0.0005	**0.0018**
14-Sep-22	B22-Se0045960	SD01_1409	Sediment	Standard	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.005	<0.005	<0.01	<0.05
Intra-Laboratory (Blind) Duplicate					N/A	N/A	N/A	N/A	**147**	N/A	**160**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**160**
Inter-Laboratory (Split) Duplicate					N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11-Dec-23	EB2339725006	EDC-SED-6	Sediment	Standard	0.0059	0.0078	0.0647	0.0051	0.2300	<0.0002	0.295	0.001	0.0016	0.0097	0.0013	0.0029	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.33
11-Dec-23	EB2339725008	QC01	Sediment	Standard	0.0173	0.0216	0.113	0.0078	0.244	<0.0002	0.357	0.004	0.0052	0.0279	0.0031	0.0056	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.450
Intra-Laboratory (Blind) Duplicate					**98**	**94**	**54**	**42**	6	N/A	19	**120**	**106**	**97**	**82**	**64**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**31**

NOTES: **1** RPD value exceeds 30% range
NA Not Applicable
- Not analysed

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date 05-Feb-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Soil QC Sample Results & RPDs

Sample Date	Laboratory Sample Number	Sample Number	Material Type	Analysis	Total Organic Fluorine (TOF) (mg/kg)	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg)												Perfluoroalkyl Sulfonamides (mg/kg)								Fluorotelomer Sulfonic Acids (FSA) (mg/kg)				Total PFAS (mg/kg)		
						PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
Laboratory Level of Reporting (µg/L)) - Standard Analysis					0.1	0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005	0.001	0.001
Laboratory Level of Reporting (µg/L)) - TOPA					-	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002	0.005	0.005
03-Nov-20	EB2029263035	BH2-0.0-0.1	Soil	Standard	<1.0	0.0009	0.0012	0.0114	0.0008	0.0415	0.0036	0.0561	<0.002	0.0006	0.0012	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0014	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0631	-	-
03-Nov-20	EB2029263027	QA03	Soil	Standard	<1.0	<0.0005	<0.0005	0.0017	<0.0005	0.113	<0.0005	0.115	<0.002	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	<0.0005	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.1150	-	-
03-Nov-20	B20-N013901	QA04	Soil	Standard	-	<0.005	<0.005	<0.005	<0.005	0.2	<0.005	0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.2000	-	-
		Intra-Laboratory (Blind) Duplicate			NA	NA	NA	**148**	NA	**93**	NA	**69**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**58**	-	-
		Inter-Laboratory (Split) Duplicate			-	NA	NA	NA	NA	**131**	NA	**112**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**104**	-	-
03-Nov-20	BH2030235035	BH2-0.0-0.1	Soil	TOPA	-	0.0008	0.0011	0.0109	0.0007	0.034	0.0024	0.0449	<0.001	0.0013	0.0061	0.0006	0.0011	<0.0002	<0.0002	0.0003	0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0698	0.0574	0.0385
03-Nov-20	EB2030235027	QA03	Soil	TOPA	-	<0.0005	<0.0005	0.0013	<0.0005	0.0545	<0.0005	0.0558	<0.003	0.0006	0.0038	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0005	<0.0005	<0.0013	<0.0013	<0.0013	<0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0609	0.0609	0.0394
		Intra-Laboratory (Blind) Duplicate			-	NA	NA	**157**	NA	**46**	NA	22	NA	**74**	**46**	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	6	2
14-Oct-21	EB2129940038	FOT02-0.0	Soil	Standard	-	<0.0002	<0.0002	0.0004	<0.0002	0.0185	0.0004	0.0189	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0193	-	-
14-Oct-21	EB2136466005	BD7_1410	Soil	Standard	-	<0.0002	<0.0002	0.0003	<0.0002	0.0212	<0.0002	0.0215	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0215	-	-
14-Oct-21	B21-De36343	SD7_1410	Soil	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	0.024	<0.0005	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	-	-
		Intra-Laboratory (Blind) Duplicate			-	NA	NA	29	NA	14	NA	13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11	-	-
		Inter-Laboratory (Split) Duplicate			-	NA	NA	NA	NA	26	NA	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	-
14-Oct-21	EB2129940059	FOT07-0.5	Soil	Standard	0.54	0.0242	0.0245	0.126	0.0134	0.529	<0.0004	0.655	0.0050	0.0174	0.0507	0.0024	0.0081	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.8020	-	-
14-Oct-21	EB2136466006	BD8_1410	Soil	Standard	0.93	0.0254	0.0292	0.195	0.0122	0.828	<0.0010	1.02	<0.005	0.0118	0.0684	0.0035	0.0087	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0025	<0.0010	<0.0025	<0.0025	<0.0025	<0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	1.1800	-	-
14-Oct-21	B21-De36344	SD8_1410	Soil	Standard	-	0.0210	0.024	0.2	0.012	0.84	<0.0005	1.04	<0.0005	0.011	0.0640	<0.0005	0.0087	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	1.1947	-	-
		Intra-Laboratory (Blind) Duplicate			**53**	5	18	**43**	9	**44**	NA	**44**	NA	**38**	30	**37**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**38**	-	-
		Inter-Laboratory (Split) Duplicate			-	14	2	**45**	11	**45**	NA	**45**	NA	**45**	23	NA	7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**39**	-	-
14-Oct-21	EB2131497031	FOT07-0.5	Soil	TOPA	-	0.0413	0.0202	0.191	0.0111	0.874	<0.0026	1.06	<0.013	0.0333	0.1040	0.0048	0.0117	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	<0.0066	<0.0026	<0.0066	<0.0066	<0.0066	<0.0066	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	<0.0026	1.2900	1.2900	0.8270
14-Oct-21	EB2136466008	BD8_1410	Soil	TOPA	-	0.0205	0.0185	0.148	0.0072	0.592	<0.0027	0.74	<0.013	0.0168	0.0818	0.0046	0.009	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0067	<0.0027	<0.0067	<0.0067	<0.0067	<0.0067	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	0.8980	0.8980	0.5760
14-Oct-21	B21-De36356	SD8_1410	Soil	TOPA	-	0.0130	0.013	0.099	0.008	0.39	<0.0005	0.489	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.5485	-	-
		Intra-Laboratory (Blind) Duplicate			-	**67**	9	25	**43**	**38**	NA	**36**	NA	**66**	24	4	26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**36**	**36**	**36**
		Inter-Laboratory (Split) Duplicate			-	**104**	**43**	**63**	**32**	**77**	NA	**74**	NA	NA	**141**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**81**	NA	NA
14-Oct-21	EB2129940069	FOT09-0.5	Soil	Standard	-	<0.0002	<0.0002	0.001	<0.0002	0.127	<0.0002	0.128	0.0010	0.0051	0.0026	0.0004	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.1380	-	-
14-Oct-21	EB2136466007	BD9_1410	Soil	Standard	-	0.0002	<0.0002	0.0021	0.0006	0.0404	<0.0002	0.0425	<0.001	<0.0002	0.0002	<0.0002	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0442	-	-
14-Oct-21	B21-De36345	SD9_1410	Soil	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	0.054	<0.0005	0.054	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0540	-	-
		Intra-Laboratory (Blind) Duplicate			-	NA	NA	**71**	NA	**103**	NA	**100**	NA	NA	NA	NA	**171**	NA	NA	NA	**55**	NA	NA	NA	NA	NA	NA	**174**	NA	NA	NA	NA	NA	NA	NA	NA	**103**	-	-
		Inter-Laboratory (Split) Duplicate			-	NA	NA	NA	NA	**81**	NA	**81**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**88**	-	-
14-Oct-21	EB2129941028	FOT19-0.0	Soil	Standard	<0.10	0.0006	0.0004	0.005	0.0005	0.0266	0.0007	0.0316	<0.001	0.0002	0.0006	0.0002	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0357	-	-
14-Oct-21	EB2136466008	BD10_1410	Soil	Standard	0.53	0.0006	0.0007	0.0061	0.0006	0.0226	0.0004	0.0287	<0.001	0.0003	0.0014	0.0003	0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0340	-	-
14-Oct-21	B21-De36346	SD10_1410	Soil	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	0.034	<0.0005	0.0409	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	-	-
		Intra-Laboratory (Blind) Duplicate			NA	0	**55**	20	18	16	**55**	10	NA	NA	**40**	**80**	**40**	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5	-	-
		Inter-Laboratory (Split) Duplicate			-	NA	NA	NA	NA	NA	NA	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	-
14-Oct-21	EB2131497048	FOT19-0.0	Soil	TOPA	-	0.0004	0.0003	0.0032	0.0003	0.0168	<0.0006	0.02	<0.001	0.0003	0.0008	0.0002	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0230	0.0230	0.0148
14-Oct-21	EB2136466008	BD10_1410	Soil	Standard	-	0.0005	0.0004	0.005	0.0004	0.0179	0.0003	0.0229	<0.001	0.0004	0.0012	0.0003	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0273	0.0270	0.0175
14-Oct-21	B21-De36357	SD10_1410	Soil	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	0.027	<0.0005	0.027	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	-	-
		Intra-Laboratory (Blind) Duplicate			-	22	29	**44**	29	6	NA	14	NA	29	**40**	**40**	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17	16	17
		Inter-Laboratory (Split) Duplicate			-	NA	NA	NA	NA	**47**	NA	30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**200**	**200**
15-Oct-21	EB2129941046	FOT25-0.0	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0087	<0.0002	0.0087	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0087	-	-
15-Oct-21	EB2136466009	BD11_1510	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0068	<0.0002	0.0068	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0068	-	-
15-Oct-21	B21-De36347	SD11_1510	Soil	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	0.013	<0.0005	0.013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	-	-
		Intra-Laboratory (Blind) Duplicate			-	NA	NA	NA	NA	25	NA	25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25	-	-
		Inter-Laboratory (Split) Duplicate			-	NA	NA	NA	NA	**40**	NA	**40**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	-
15-Oct-21	EB2129941053	FOT28-0.0	Soil	Standard	-	<0.0002	<0.0002	0.0003	<0.0002	0.0004	<0.0002	0.0007	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	-	-
15-Oct-21	EB2136466010	BD12_1510	Soil	Standard	-	<0.0002	<0.0002	0.0003	<0.0002	0.0004	<0.0002	0.0007	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	-	-
15-Oct-21	B21-De36348	SD12_1510	Soil	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	-	-
		Intra-Laboratory (Blind) Duplicate			-	NA	NA	0	NA	0	NA	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	-	-
		Inter-Laboratory (Split) Duplicate			-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	-
15-Oct-21	EB2129941066	FOT32-0.5	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	-	-
15-Oct-21	EB2136466011	BD13_1510	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	-	-
15-Oct-21	B21-De36349	SD13_1510	Soil	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	-	-
		Intra-Laboratory (Blind) Duplicate			-	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	-	-
		Inter-Laboratory (Split) Duplicate			-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	-
12-Oct-21	EB2129938037	FTG13-0.0	Soil	Standard	0.12	<0.0002	<0.0002	0.0004	<0.0002	0.009	<0.0002	0.0094	<0.001	0.0005	0.0003	0.0004	0.0007	0.0017	0.001	0.0004	0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0020	0.0009	0.0175	-	-
12-Oct-21	EB2136466003	BD3_1210	Soil	Standard	0.1	<0.0002	<0.0002	0.0005	<0.0002	0.0121	0.0022	0.0126	<0.001	0.0007	0.0004	0.0006	0.0011	0.0034	0.0021	0.0014	0.0006	0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0041	0.0028	0.0322	-	-
12-Oct-21	B21-De36341	SD3_1210	Soil	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	0.012	<0.0005	0.012	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0057	<0.0005	<0.005	-	-
		Intra-Laboratory (Blind) Duplicate			18	NA	NA	22	NA	29	NA	29	NA	**33**	29	**40**	**44**	**67**	**71**	**111**	**100**	NA	29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**69**	**103**	**59**	-	-
		Inter-Laboratory (Split) Duplicate			-	NA	NA	NA	NA	29	NA	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**96**	NA	-	-
12-Oct-21	EB2131497008	FTG13-0.0	Soil	TOPA	-	<0.0002	<0.0002	0.0005	<0.0002	0.0079	0.0004	0.0084	0.0010	0.0018	0.0022	0.002	0.0019	0.0025	0.0015	0.0007	0.0004	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0228	0.0224	0.0152
12-Oct-21	EB2136466003	BD3_1210	Soil	TOPA	-	<0.0002	<0.0002	0.0008	<0.0002	0.0123	0.0025	0.0131	0.0020	0.0042	0.0052	0.0054	0.005	0.0072	0.0049	0.0030	0.0021	0.0008	0.0006	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0558	0.0533	0.0376
		Intra-Laboratory (Blind) Duplicate			-	NA	NA	**46**	NA	**44**	**145**	**44**	**67**	**80**	**81**	**92**	**90**	**97**	**106**	**124**	**136**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**84**	**82**	**85**
13-Oct-21	EB2129938060	FTG21-0.0	Soil	Standard	-	0.0003	0.0012	0.0416	0.0013	0.0004	<0.0002	0.042	<0.001	0.0008	0.0036	0.0016	0.0175	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	0.0024	<0.0005	<0.0005	<0.0005	0.0707	-	-
13-Oct-21	EB2136466016	BD4_1310	Soil	Standard	-	<0.0002	<0.0002	0.0082	0.0056	0.0257	0.0003	0.0339	<0.001	<0.0002	<0.0002	<0.0002	0.0106	0.0006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	0.0021	0.0019	<0.0005	<0.0005	0.0550	-	-
		Intra-Laboratory (Blind) Duplicate			-	NA	NA	**134**	**125**	**194**	NA	21	NA	NA	NA	NA	**49**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25	-	-
13-Oct-21	EB2129940004	FTG37-0.0	Soil	Standard	-	<0.0002	<0.0002	0.0005	<0.0002	0.0058	<0.0002	0.0063	<0.001	0.0008	0.0012	0.001	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0102	-	-
13-Oct-21	EB2136466004	BD6_1310	Soil	Standard	-	<0.0002	<0.0002	0.001	<0.0002	0.0049	<0.0002	0.0059	<0.001	0.0014	0.0018	0.0008	0.0006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0105	-	-
13-Oct-21	B21-De36342	SD6_1310	Soil	Standard	-	<0.0005	<0.0005	<0.0005	<0.0005	0.0058	<0.0005	0.0058	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	-	-
		Intra-Laboratory (Blind) Duplicate			-	NA	NA	**67**	NA	17	NA	7	NA	**55**	**40**	22	**40**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	-	-
		Inter-Laboratory (Split) Duplicate			-	NA	NA	NA	NA	0	NA	8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	-
15-Oct-21	EB2129940022	FTG41-0.3	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0067	<0.0002	0.0067	<0.001	0.0002	<0.0002	0.0002	<0.0002	0.0003	<0.0002	0.0002	<0.0002	0.0003	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<

Epic File: BC200153.03
Site: Callide Power Station
Client: CS Energy
Report Date 05-Feb-24

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Soil QC Sample Results & RPDs

Sample Date	Laboratory Sample Number	Sample Number	Material Type	Analysis	Total Organic Fluorine (TOF) (mg/kg)	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg)												Perfluoroalkyl Sulfonamides (mg/kg)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg)				Total PFAS (mg/kg)		
						PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_9 Sulfonates	Sum of TOP C_4 - C_{14} as Fluorine
Laboratory Level of Reporting (µg/L)) - Standard Analysis					0.1	0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005	0.001	0.001
Laboratory Level of Reporting (µg/L)) - TOPA					-	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002	0.005	0.005
29-Jun-22	EB2219210049	CA01-0.0	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0008	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
28-Jun-22	EB2219210041	BD01_2806	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0008	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
28-Jun-22	B22-JI0009939	SD01_2806	Soil	Standard	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005	<0.005	-	-
Intra-Laboratory (Blind) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
Inter-Laboratory (Split) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
29-Jun-22	EB2219210065	CA06-0.0	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
28-Jun-22	EB2219210042	BD02_2806	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
28-Jun-22	B22-JI0009940	SD02_2806	Soil	Standard	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005	<0.005	-	-
Intra-Laboratory (Blind) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
Inter-Laboratory (Split) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
29-Jun-22	EB2219210083	CA10-0.0	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	**0.0003**	**0.0003**	**0.0014**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.002**	-	-
28-Jun-22	EB2219210043	BD03_2806	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	**0.0002**	**0.0002**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0008**	-	-
28-Jun-22	B22-JI0009941	SD03_2806	Soil	Standard	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005	<0.005	-	-
Intra-Laboratory (Blind) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**40**	**40**	**111**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**86**	-	-
Inter-Laboratory (Split) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
29-Jun-22	EB2219210094	CA13-0.0	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0164	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
28-Jun-22	EB2219210044	BD04_2806	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.012	<0.0204	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
28-Jun-22	B22-JI0009942	SD04_2806	Soil	Standard	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005	<0.005	-	-
Intra-Laboratory (Blind) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
Inter-Laboratory (Split) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
29-Jun-22	EB2219210008	AD1-2-0.0	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
28-Jun-22	EB2219210046	BD06_2906	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
29-Jun-22	B22-JI0009944	SD06_2906	Ash	Standard	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.001	<0.005	<0.005	<0.005	<0.005	-	-
Intra-Laboratory (Blind) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
Inter-Laboratory (Split) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
30-May-23	EB2316807007	AD404-10.0	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
30-May-23	EB2316807075	BD01_3005	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
30-May-23	B23-Jn0028026	SD01_3005	Ash	Standard	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.01	<0.005	<0.005	<0.05	-	-
Intra-Laboratory (Blind) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
Inter-Laboratory (Split) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
30-May-23	EB2316807064	AD414-2-0	Ash	Standard	-	<0.0002	<0.0002	0.0003	<0.0002	0.0002	<0.0002	0.0005	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	-	-
30-May-23	EB2316807076	BD02_3005	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
30-May-23	B23-Jn0028027	SD02_3005	Ash	Standard	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.01	<0.005	<0.005	<0.05	-	-
Intra-Laboratory (Blind) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
Inter-Laboratory (Split) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
31-May-23	EB2316807054	AD411-1-0	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
31-May-23	EB2316807077	BD03_3105	Ash	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
31-May-23	B23-Jn0028028	SD03_3105	Ash	Standard	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.01	<0.005	<0.005	<0.05	-	-
Intra-Laboratory (Blind) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
Inter-Laboratory (Split) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
01-Jun-23	EB2316811025	MW97-0.2	Soil	Standard	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	-
01-Jun-23	EB2316811026	BD04_0106	Soil	Standard	-	<0.0002	<0.0002	0.0002	<0.0002	0.0003	<0.0002	0.0005	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	-	-
01-Jun-23	B23-Jn0028029	SD04_0106	Soil	Standard	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.01	<0.005	<0.005	<0.05	-	-
Intra-Laboratory (Blind) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-
Inter-Laboratory (Split) Duplicate					-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-

NOTES:
1 RPD value exceeds 30% range
NA Not Applicable
- Not analysed

APPENDIX L ADDENDUM SAQP (EPIC, 2023A)



Callide Power Station Environmental Evaluation - Addendum Sampling Analysis and Quality Plan

CS Energy Ltd
Callide Power Station Environmental Evaluation
Callide Power Station
BC200153.03
10 May 2023

CONTENTS

1 Introduction 5
1.1 EE Requirements 5
1.2 Document Structure and Purpose 6
1.3 Roles and Responsibilities 7
2 Site Identification 8
3 Background and CSM Summary (Epic, 2022c) 10
3.1 Source-Pathway-Receptor Model 12
4 Summary of Identified Data Gaps 17
4.1 Data Gap 1 Summary: AD4 21
4.1.1 Supplementary Historical Aerial Review: AD4 22
4.2 Data Gap 2 and 3 Summary: Callide A 27
4.2.1 GHD (2022): Callide A and R2 30
4.2.2 Supplementary Historical Aerial Review: Callide A 31
4.3 Data Gap 4 to 6 Summary: Groundwater and Surface Water PFAS 38
5 Data Quality Objectives 40
5.1 Establishing DQOs 40
6 Proposed Additional Investigation 46
6.1 Objective 46
6.2 Data Gap 1: AD4 Investigation 46
6.3 Data Gap 2 and 3: Callide A Investigation 46
6.4 Data Gap 4 to 6: Groundwater and Surface Water Monitoring 47
6.5 Summary of Other Works to Address Data Gaps 48
6.5.1 Release Point R2 (Data Gap 3) 48
6.5.2 Groundwater Bore Installation Program (Data Gaps 4 and 5) 48
6.5.3 Northern Boundary Flow Monitoring (Data Gap 6) 49
6.5.4 Landowner Sampling Program (Data Gap 7) 49
6.6 Methodology 49
6.7 Laboratory Analysis 52
6.8 Assessment Criteria 53
6.9 Quality Assurance and Quality Control Program 54
6.9.1 Field Quality Assurance and Quality Control 54
6.9.2 Laboratory Quality Assurance and Quality Control 55
6.9.3 Data Quality Indicators 56
7 References 58
8 Acronyms 60

LIST OF FIGURES

Body Report

Figure 1. General Site Layout (source Queensland Globe) 9
Figure 2. Coal Plant and AD4 – PFAS concentration in sediment (Epic, 2022c) 22
Figure 3. Callide A and Dunn Creek – PFAS Composition 29
Figure 4. Callide A and Dunn Creek – PFAS Concentration 30
Figure 5. Ash Dam 2 Embankment Rise and Wetland Typical Design (GHD, 2022) 31

Figure Section

Figure F1. Site Location and Areas of Interest
Figure F2. AD4 Previous and Proposed Investigation Locations
Figure F3. Callide A Previous and Proposed Investigation Locations
Figure F4. Proposed Quarterly Groundwater and Surface Water Sampling Locations
Figure F5. Proposed Seasonal Groundwater and Surface Water Sampling Locations
Figure F6. Proposed Annual Groundwater and Surface Water Sampling Locations
Figure F7. Proposed Event Based Surface Water Sampling Locations

LIST OF TABLES

Body Report

Table 1. EE E-100046349 Requirement 3 6
Table 2. Identified Data Gaps (Epic, 2022c) 6
Table 3. Key Roles 7
Table 4. Site Identification 8
Table 5. Summary of Data Gaps and CSM Elements (Epic, 2022c) 10
Table 6. Summary of Pathway and Receptor Linkages (Epic, 2022c) 13
Table 7. Identified Data Gap and Proposed Actions 18
Table 8. Historical Aerial Review: AD4 23
Table 9. Document Review: Callide A – Ash Dam 2 Investigation and Engineering Plan 30
Table 10. Historical Aerial Review 32
Table 11. Summary of DQO aspects of proposed investigation 40
Table 12. Proposed Groundwater and Surface Water Monitoring Program 47
Table 13. Soil Sampling Methodology 49
Table 14. Surface Water Sampling Methodology 50
Table 15. Groundwater Sampling Methodology 50
Table 16. Proposed Laboratory Analytical Schedule 53
Table 17. Adopted Groundwater and Surface Water Assessment Criteria 54
Table 18. Adopted Soil and Sediment Assessment Criteria 54
Table 19. Field Quality Assurance and Quality Control 54
Table 20. Laboratory Quality Assurance and Quality Control 55
Table 21. Data Quality Indicators 56

Tables Section

Table T1. Quarterly Sampling Locations
Table T2. Seasonal (Wet/Dry) Sampling Locations
Table T3. Annual Sampling Locations
Table T4. Event Based Sampling Locations (Rainfall >20mm)

LIST OF APPENDICES

Appendix A **Current CS Energy Sampling Locations**

Appendix B **CS Energy Northern Boundary Sensors**

Appendix C **Aerial Photographs**

DOCUMENT CONTROL

Revision	Revision date	Revision details	Author	Editorial review	Technical review	Approver
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1 INTRODUCTION

CS Energy Limited (CS Energy) currently operate the Callide Power Station (CPS) site, located approximately 9 km north-east of Biloela, Queensland. Following release of the Queensland Department of Environmental Sciences' (DES's) Operational Policy for the management of firefighting foam in 2016, CS Energy undertook a review of site operations and identified historical use of per- and poly-fluoroalkyl substances (PFAS). This review identified former storage and use of non-compliant and persistent Aqueous film forming foams (AFFF) at the site. Removal of all non-compliant AFFF commenced in late 2018, with all non-compliant AFFF removed from service and disposed to a licensed disposal facility.

Following removal of non-compliant AFFF, CS Energy committed to DES to undertake a voluntary PFAS Environmental Investigation, to assess potential impacts associated with the former use of PFAS containing products at the site. Epic Environmental (Epic) was engaged by CS Energy to undertake assessment of per- and poly-fluoroalkyl substances (PFAS) at CPS as part of this voluntary investigation. Under the voluntary arrangement, CS Energy also submitted an initial monitoring plan to DES and continue to operate in accordance with it.

Initial investigations completed at the site in 2019 targeted existing onsite and offsite environmental monitoring locations, with the investigation expanded during 2020 and 2021 to include sampling of private groundwater supply wells up to 10 km downstream of the site. To date, a total of 158 groundwater monitoring bores and 50 surface water monitoring locations have been sampled, with results from monitoring completed to date reporting concentrations of Sum of PFOS and PFHxS above the Australian Drinking Water Guideline (0.07 µg/L Sum of PFOS and PFHxS) in onsite and offsite groundwater monitoring wells (Sum of PFOS and PFHxS up to 3.73 µg/L and 6.11 µg/L respectively) and onsite and offsite surface water (Sum of PFOS and PFHxS up to 0.481 µg/L and 0.244 µg/L respectively). All results from sampling completed to date have been provided to DES and the Contaminated Land Auditor.

A Notice to conduct or commission an Environmental Evaluation (EE) notice (Reference: EPPR00536313 | CCPLRC-100046232 | E-100046349, dated 15 December 2021) was formally issued by DES requiring CS Energy to commission an environmental investigation to determine the nature and extent of impact arising from any direct or indirect release of PFAS from the historical use of AFFF at the site.

A site investigation was completed in accordance with the requirements of the EE, with a contaminated land investigation document (CLID (Epic, 2022c)) submitted to DES on 7 September 2022 in accordance with EE Requirement 5. The report detailed findings of site investigations, remaining data gaps identified, and provided recommendations in accordance with EE Requirements 5(e) and 5(f).

Correspondence received from DES on 4 October 2022 requested that further works be completed to address data gaps identified in the CLID (Epic, 2022c), with the original EE amended (amended notice issued 4 October 2022) to allow further investigation to be completed to address the identified data gaps with the final environmental report required by 5:00pm on 13 October 2023.

This addendum SAQP has been prepared to address the previously identified data gaps, which are discussed further in **Section 1.1**. It is intended that this SAQP will be used to supplement ongoing works on the site as detailed in the previously prepared SAQP (Epic, 2022b).

1.1 EE Requirements

Details of requirements for preparation of a sampling analysis and quality plan (SAQP) are outlined in EE Requirement 3, as summarised in **Table 1**.

Table 1. EE E-100046349 Requirement 3

Item	EE E-100046349 Requirements (Section B)
3	By **5:00 pm on 28 February 2022** you must develop and submit a sampling, analysis and quality plan (SAQP) to the department to characterise the potential source and extent of PFAS contamination likely to be caused from the release of AFFF at the premises for the purpose of preparing a site investigation report as defined in section 387 of the Act. This plan must be prepared by a SQP and consented to by a contaminated land auditor. This investigation detailed in the SAQP must, as a minimum:
3(a)	evaluate the nature and extent of PFAS contamination likely to have been caused by any direct or indirect release of AFFF from the premises to soil, water, groundwater, sediments and, include biota sampling in Callide Creek adjoining the premises as part of the investigation; and
3(b)	assess likely pathways of PFAS contamination from the release of AFFF from the premises including, but not limited to, the premises, surface waters, drainage lines, stormwater infrastructure and groundwater in the vicinity of the premises; and
3(c)	assess the nature of the connectivity/completeness of those likely pathways by, assessing (where applicable) groundwater levels versus surface water levels and connectivity, hydraulic conductivity and groundwater velocity, and evaluate the potential for surface water releases from Callide dam to enhance migration of PFAS contaminants from the site.
3(d)	the sampling analysis must be generally in accordance with all requirements stated in Requirement 7.

1.2 Document Structure and Purpose

The purpose of this Addendum SAQP is to detail the works required to be completed to address data gaps identified at the site as part of the investigation detailed in the CLID (Epic, 2022c). Background information related to the site and previous investigations are detailed in the CLID for the site (Epic, 2022c) and should be read in conjunction with this document.

It is noted that additional information and data collected through the implementation of this Addendum SAQP will be used in conjunction with other scopes (**Section** 4) to develop an updated CLID to address EE requirements (as required).

A summary of identified data gaps is detailed in **Table 2**, with further details on data gaps and additional works proposed to be completed detailed in **Section 4**.

Table 2. Identified Data Gaps (Epic, 2022c)

Data Gap	Details
1	Results from soil and sediment investigations at Ash Dam 4 (AD4) indicate that a localised source of PFAS may be present within AD4. Further investigation will be required to determine the nature and extent of potential impacts at AD4.
2	Soil investigations completed at Callide A indicate a localised PFAS impact may be present within the catchment of the Northern Stormwater Pond (NSP), with elevated concentrations of PFAS reported in soils (coal ash/dust) within the northern sediment pond along with surface water. Further investigation will be required to determine the nature and extent of potential impacts at the Callide A NSP.
3	PFAS is reported to be present in Dunn Creek, with results indicating that discharges from the Callide A site (via release point R2) are likely to be contributing to PFAS concentrations, noting limited water is released via R2 and PFAS impacts were also reported in upstream surface water within Dunn Creek (downgradient of the Callide Mine). No PFAS was identified in ash (soil samples) within Ash Dam 2 or the majority of soil samples collected at Callide A, with PFAS reported at R2 likely associated with soil impacts identified at the NSP. Further investigation will be required to confirm the source and associated migration pathways of PFAS reported within R2.
4	Groundwater results indicate that the eastern seepage area likely comprises at least two seepage pathways, one associated with the current seepage pathway and seepage recovery system, and an additional longer pathway associated with fractured rock which includes monitoring well MW32. Further investigation will be required to confirm the nature and extent of seepage pathways at the eastern seepage area.
5	Groundwater results from the western seepage area indicate some wells, including MW49, may be outside the current groundwater seepage recovery area. In addition, surface water within the western stormwater diversion channel (carrying stormwater from the north) may infiltrate through alluvial soils

Data Gap	Details
	in the south-western portion of the site, potentially contributing to PFAS impacts in groundwater. Further investigation will be required to confirm the nature and extent of seepage pathways at the western seepage area along with potential contribution from surface water infiltration.
6	High concentrations of PFAS have been reported to be entering the northern boundary of the site via surface water, with surface water, groundwater and sediment impacts identified within the northern and western stormwater diversion channels. Further investigation will be required to assess the nature (including mass) of PFAS entering the site via these pathways. It is noted that management of PFAS impacts from these pathways will need to be undertaken in conjunction with remediation and/or management of offsite source areas.
7	Potential risks to human and ecological health have been identified (refer EE CLID Sections 12.2 and 12.3 respectively). Further assessment of risk will be required to be completed to quantify potential risks to human and ecological receptors. It is noted that biota sampling was presented as Appendix E to the EE CLID.

1.3 Roles and Responsibilities

Epic was engaged by CS Energy to perform the function of a SQP in accordance with the requirements of the EE. The key roles relating to the project have been summarised in **Table 3** below.

Table 3. Key Roles

Aspect	Details
Suitably Qualified Person (SQP)	Mr Luke Amies Epic Environmental Pty Ltd Completion of environmental investigations and reporting requirements of the EE
Contaminated Land Auditor (CLA)	Mr Mark Stuckey Environmental Earth Sciences Oversee SQP carrying out the requirements of the EE and undertake an Auditor's Function in accordance with Section 568(b) of the Environmental Protection Act 1994.
Recipient / Site Owner	CS Energy Limited Level 2, HQ (North Tower) 540 Wickham Street Fortitude Valley QLD 4006 Commissioning of and compliance with requirements of the EE

2 SITE IDENTIFICATION

The site consists of three coal fired power stations; Callide A, Callide B and Callide C. Callide A Power Station was constructed in 1965, operating up until 1988 when Callide B Power Station was commissioned and supplemented with the addition of Callide C Power Station which was commissioned in 2001. Callide A Power Station was retrofitted to trial low emission coal-fired (oxyfuel trial) power generation between 2012 and 2015. Both Callide B and Callide C continue to operate.

The current combined generation capacity of site (Callide B and Callide C Power Stations) is 1,532 MW with site operations managed under Environmental Authorities EPPR00536313 (Callide A and B) and EPPR00707213 (Callide C) in addition to the internal CS Energy Environmental Management System. Callide B and C manage ash and water internally within the adjacent Waste Containment Facility (WCF) located immediately east of Callide B and C (**Figure F1**).

The site occupies two land parcels located at Biloela Callide Road, Mount Murchinson as outlined in **Table 4.** The operational areas of the power station are split between the two lots, with the majority of the WCF located within Lot 1 RP615528 as shown in **Figure 1** and site features in **Figure F1**.

Table 4. Site Identification

Aspect	Detail	
Lot Details	1 RP615528	4 SP103557
Address	Biloela Callide Road, Mount Murchison QLD 4715	Biloela Callide Road, Mount Murchison QLD 4715
Area (ha)	631.933	239.200
Site Owner	CS Energy Limited	CS Energy Limited
Local Government Authority	Banana Shire Council	Banana Shire Council
GPS Coordinate (centroid) – Lat/Long GDA2020	-24.34965, 150.60836	-24.33583, 150.62181

Current Use and Main Features	• Callide C and part of Callide B Power Stations and associated infrastructure.
	• The western portion of the current Waste Containment Facility comprising of:
	  • DRD and the majority of the Evaporation Ponds.
	  • Ash Dam B (ADB) and associated seepage recovery system.
		• Callide A and balance of Callide B Power Stations and a number of associated infrastructure, including administration building.
		• Coal Plant
		• Ash Dams 1, 2, 3 and 4

Proposed Use	Not determined	Not determined
Zoning	Special Industry	Special Industry
EMR/CLR Status	Included on Environmental Management Register (EMR) for the following Notifiable Activities: • Petroleum Product or Oil Storage • Chemical Storage • Coal Fired Power Station • Waste Storage, Treatment or Disposal Not included on the Contaminated Land Register (CLR)	Included on EMR for the following Notifiable Activities: • Asbestos Manufacture or Disposal • Petroleum Product or Oil Storage • Chemical Storage • Coal Fire Power Station • Waste Storage, Treatment or Disposal Not included on the CLR
EMR ID	12271	30829



Figure 1. General Site Layout (source Queensland Globe)

3 BACKGROUND AND CSM SUMMARY (EPIC, 2022C)

Details on the site history, background information, environmental setting and detailed Conceptual Site Model (CSM) are presented in the EE SAQP (Epic, 2022b) and the previously submitted CLID (Epic, 2022c). A summary of investigation findings and key CSM elements associated with identified data gaps are summarised in **Table 5**, with a summary of source-pathway-receptor linkages detailed in **Section 3.1**.

Table 5. Summary of Data Gaps and CSM Elements (Epic, 2022c)

Data Gap		CLID Investigation Findings/CSM Elements
1	Results from soil and sediment investigations at AD4 indicate that a localised source of PFAS may be present within AD4. Further investigation will be required to determine the nature and extent of potential impacts at AD4.	• One of the samples collected at AD4 (AD401-0.5) reported concentrations of PFAS above the ecological indirect criteria of 0.01 mg/kg. It is understood that areas of AD4 adjacent to bore AD401 are used to dispose road sweeping and vacuum excavation spoil, with PFAS concentrations likely to be associated with disposal of other materials/wastes rather than impacts. Sediment samples collected adjacent to AD4 (refer above) indicate that a localised source of PFAS may be present within AD4. Based on the results of soil and sediment sampling, a localised source area is likely present in the northern portion of AD4. • Sediment investigations at AD4 reported an increase in PFAS concentrations compared with upstream samples from areas surrounding the Coal Stockpile/Coal Plant. All results were reported below the adopted assessment criteria for soil, however results indicate that a localised source of PFAS may be present within AD4. Soil investigation completed in the north-eastern corner of AD4 reported concentrations of PFAS (Sum of PFOS and PFHxS of 0.0155 mg/kg) above the adopted assessment criteria of 0.01 mg/kg, however the composition of PFAS is not consistent with sediment samples and another source may be present. It is noted that overland flow from the waste oil store and western areas of the Coal Plant can drain towards the drains surrounding AD4.
2	Soil investigations completed at Callide A indicate a localised PFAS impact may be present within the catchment of the NSP, with elevated concentrations of PFAS reported in soils (coal ash/dust) within the northern sediment pond along with surface water. Further investigation will be required to determine the nature and extent of potential impacts at the Callide A NSP	• Callide A is unlikely to comprise a primary source area, with the majority of samples reported below the laboratory's LOR and/or the adopted assessment criteria. One location (CA15) within the NSP reported concentrations of PFOS above the ecological indirect criteria of 0.01 mg/kg, representing layers of coal ash/dust approximately 1.0 m deep. It is assumed that the sample represents sediment runoff from the adjacent coal stockpile and coal hopper (decommissioned in 1988), however other locations collected within these area (CA12, CA13 and CA14) reported concentrations below the laboratory's LOR. It is likely that PFAS impacts identified in the NSP are associated with the use of a portable foam-type extinguisher in the station (observed at extinguisher stations throughout the station) or the use of AFFF on coal stockpiles, with a localised PFAS impact present within the catchment of the NSP.
3	PFAS is reported to be present in Dunn Creek, with results indicating that discharges from the Callide A site (via release point R2) are likely to be contributing to PFAS concentrations, noting limited water is released via R2 and PFAS impacts were also reported in upstream surface water within Dunn Creek (downgradient of the Callide Mine). No PFAS was identified in ash	• PFAS is reported to be present in Dunn Creek (total PFAS up to 0.244 µg/L at SW18), with results indicating that concentrations are likely to be associated with discharges from the Callide A site (via release point R2, noting limited water is released via R2) combined with upstream sources, with PFAS impacts reported in upstream surface water within Dunn Creek (downgradient of the Callide Mine) at SW18. In general, concentrations were higher in upstream surface water. No PFAS was identified in ash (soil samples) within Ash Dam 2, however PFAS was identified in surface water (total

Data Gap		CLID Investigation Findings/CSM Elements
	(soil samples) within Ash Dam 2 or the majority of soil samples collected at Callide A, with PFAS reported at R2 likely associated with soil impacts identified at the NSP. Further investigation will be required to confirm the source of PFAS reported within R2.	PFAS up to 0.0561 µg/L) and soil (total PFAS up to 0.0655 mg/kg) in the NSP, with PFAS reported at R2 (total PFAS up to 0.202 µg/L) likely associated with these impacts. • Samples from Callide Dam (downstream of Dunn Creek) all reported concentrations of PFAS below the LOR, however the LOR was raised in the majority of samples due to suspended solids.
4	Groundwater results indicate that the eastern seepage area likely comprises at least two seepage pathways, one associated with the current seepage pathway and seepage recovery system, and an additional longer pathway associated with fractured rock which includes monitoring well MW32. Further investigation will be required to confirm the nature and extent of seepage pathways at the eastern seepage area.	• Groundwater results for the eastern seepage area report significant differences in both concentration and composition between onsite wells (MW11, ESC1, ESC3, ESC4, total PFAS up to 0.859 µg/L) and offsite wells (MW31, MW32, MW33 and MW43, total PFAS up to 9.850 ug/L). It is likely that the eastern seepage area comprises at least two seepage pathways, one associated with the current seepage pathway/seepage recovery system, and an additional longer pathway associated with fractured rock which includes monitoring well MW32.
5	Groundwater results from the western seepage area indicate some wells, including MW49, may be outside the current groundwater seepage recovery area. In addition, surface water within the western stormwater diversion channel (carrying stormwater from the north) may infiltrate through alluvial soils in the south-western portion of the site, potentially contributing to PFAS impacts in groundwater. Further investigation will be required to confirm the nature and extent of seepage pathways at the western seepage area along with potential contribution from surface water infiltration.	• Groundwater results from the western seepage area reported PFAS composition to be relatively comparable across all monitoring wells, with MW49 reporting a greater proportion of PFHxS and highest concentrations (total PFAS up to 4.67 µg/L, approximately one order of magnitude higher than other wells [total PFAS between 0.22 – 1.01 ug/L]). • It is likely that surface water within the Western Stormwater Diversion Channel infiltrates through shallow alluvial soils in the southern portion of the site, however current results indicate this is unlikely to be cause of elevated concentrations within MW49. These elevated concentrations may be due to this location being outside of the current groundwater seepage capture area.
6	High concentrations of PFAS have been reported to be entering the northern boundary of the site via surface water, with surface water, groundwater and sediment impacts identified within the northern and western stormwater diversion channels. Further investigation will be required to assess the nature (including mass) of PFAS entering the site via these pathways. It is noted that management of PFAS impacts from these pathways will need to be undertaken in conjunction with remediation and/or management of offsite source areas.	• Groundwater results for background monitoring wells located along the northern (hydraulically upgradient) boundary indicate that groundwater located along the northern site boundary (as represented by MW01 and MW74) is likely to have been impacted from surface water entering the northern site boundary from the area of the mine (operated by Batchfire), which has reported elevated concentrations of PFAS (including SW34 and SW33). It is noted that based on the topography of areas north of the site, groundwater impacts may be localised to areas along the northern site boundary where surface water pools following flow events, with features including the railway line providing a constriction to surface water flows. • PFAS is reported to be entering the site along the northern site boundary from the area of the mine (operated by Batchfire) via SW33, SW34 and SW45 at concentrations up to 6.62 µg/L total PFAS, exceeding the 95% species protection limit (0.13 µg/L PFOS) and the drinking water criteria (0.07 µg/L Sum of PFOS and PFHxS). Once surface water has entered the site it is observed to flow along the NSDC and WSDC and discharge to Callide Creek via SW28. Concentrations of PFAS at the point of discharge (SW28, total

Data Gap		CLID Investigation Findings/CSM Elements
		PFAS up to 0.39 µg/L) are considerably lower than those at the northern site boundary (up to 6.62 µg/L at SW34), with concentrations of PFOS exceeding the 99% species protection limit. Sediment sampling along the NSDC (refer below) indicate approximately 1.0 – 1.5 km of sediments within the NSDC, commencing at SW34 and continuing to between NSDC2 (1.0 km) and NSDC3 (1.5 km) has been impacted by PFAS contaminated surface water entering the site along the northern site boundary (see **Figure F2**). • Results from sediment investigations indicate sediments within the NSDC, commencing at SW34 and continuing to between NSDC2 (1.0 km) and NSDC3 (1.5 km) have been impacted by PFAS contaminated surface water entering the site along the northern site boundary. Beyond 1.5km (sample NSDC3) impacts associated with offsite sources is no longer observed. Sediment impacts remain along the length of the NSDC and WSDC, which may be associated with the offsite impacts noted above, however there is insufficient evidence to indicate whether the site may be contributing, or has historically contributed to PFAS concentrations with the stormwater diversion channels. Concentrations of PFAS were also reported in sample SW45 (north-eastern portion) and SW38 (north-western portion) which may indicate additional minor PFAS impacts from upgradient areas (see **Figure F4**).
7	Potential risks to human and ecological health have been identified (refer EE CLID Sections 12.2 and 12.3 respectively). Further assessment of risk will be required to be completed to quantify potential risks to human and ecological receptors.	• It is noted that biota sampling was presented as Appendix E to the EE CLID.

3.1 Source-Pathway-Receptor Model

A summary of source, pathway and receptor linkages detailed as part of the EE CLID are detailed in **Table 6**.

Table 6. Summary of Pathway and Receptor Linkages (Epic, 2022c)

Source	Migration Pathways	Receptor(s)	Considerations / Comments
Onsite Migration Pathways – Callide B and C	The primary onsite pathways for migration of PFAS from source areas at Callide B and C are via surface water flows through onsite drainage and overland flow to the DRD and ultimately to Ash Dam B (EMS 2022). Results indicate surface water within the DRD and ADB are generally comparable. Once within Ash Dam B, pathways for PFAS migration include: • Circulation within Ash Dam B via movement of surface water and operational water uses (i.e. dust suppression, ash watering) • Adsorb to ash, sediments and soils within Ash Dam B, although limited PFAS has been identified in ash disposal areas • Infiltrate to groundwater and discharge via deep seepage (approximately 75% recovered and returned to Ash Dam B) • Discharge via shallow seepage (collected as surface water in seepage collection trenches and returned to Ash Dam B) • Licenced stormwater discharges (occasional). The estimates of deeper seepage recovered and fugitive seepage from Ash Dam B to Callide Creek are 558 m^3/day and 188 m^3/day respectively (EMS 2022), equating to successful recovery of approximately 75% of deeper seepage. It is estimated that the mass of PFAS within water contained within Ash Dam B is between 0.15 kg to 0.6 kg, with the mass of PFAS in fugitive seepage (not recovered) currently estimated to be approximately 0.01 kg per year (EMS 2022). Surface water entering the site from the direction of the mine, located upgradient (north) of the site was reported to contain elevated concentrations of PFAS. Upgradient water is diverted around the northern and western boundaries of Ash Dam B via the Western Stormwater Diversion Channel. During large rainfall	The receptors associated with the migration pathways in Callide B and C include: • Dermal contact, inhalation or ingestion exposure pathway to site workers operating in areas impacted by PFAS (soil or water) • Plant uptake associated with ecological receptors of current and future revegetated areas (including rehabilitated areas) • Exposure of migratory birds and other transient fauna interacting with the environs of the waste containment facility including the Western Stormwater Diversion Channel	• The risk to site users is considered relatively low based upon the operational conditions and controls required for workers interacting with impacted soils and waters • The current high salinity of the major water bodies onsite (Ash Dam B and Borrow Pits A and B) is likely to preclude consumption or plant uptake pathways associated with ecological (flora and fauna receptors)

Source	Migration Pathways	Receptor(s)	Considerations / Comments
	events, surface water diverted around the site will discharge directly to Callide Creek, with some water retained within the diversion channel. During smaller rainfall events, surface water may be retained within the diversion channel. Water retained within the diversion channel in the southwestern corner of the site is anticipated to infiltrate to groundwater through alluvial soils and eventually the Callide Creek alluvium (EMS 2022), although current results indicate this is unlikely to be a significant source of PFAS impacts in groundwater. A generalised CSM for Callide A and a detailed CSM for the investigation are included in Appendix G of the EE CLID.		
Onsite Migration Pathways – Callide A	The primary onsite pathways for migration of PFAS at Callide A is via surface water flows which are directed to the eastern and NSPs (located upstream of the Ash Dam 2 catchment). Sediment comprising coal ash/dust observed in the NSP reported elevated concentrations of PFAS, indicating possible migration of PFAS via transport of sediment from the coal stockpile. Release of water is authorised under CS Energy's Environmental Authority at Release Point R2, located at the toe of Ash Dam 2. Releases discharge directly into Dunn Creek. PFAS has been detected in surface water within the eastern and NSPs (up to 0.0130 µg/L and 0.0561 µg/L total PFAS respectively), along with water at release point R2 (0.0053 – 0.2020 µg/L total PFAS). Surface water from areas upgradient (north) of Callide A are directed to a mine dam (Dunn Creek Dam) located adjacent to the north-eastern corner of the site. Dunn Creek Dam is an authorised mine affected water release location (Environmental Authority EPML00720413 Callide Coal Mine). Concentrations of PFAS in Dunn Creek (upstream of Callide A) reported concentrations of total PFAS up to 0.244 µg/L. A generalised CSM for Callide A and a detailed CSM for the investigation are included in Appendix G of the EE CLID.	The receptors associated with the migration pathways in Callide A include: • Dermal contact, inhalation or ingestion exposure pathway to site workers operating in areas impacted by PFAS (soil or water) • Flora ecological receptors of current and future revegetated areas (including rehabilitated areas) • Ecological receptors (aquatic and terrestrial) associated with Dunn Creek and Callide Dam	• The risk to site users is considered relatively low based upon both the decommissioned status of Callide A and the operational conditions and controls required for workers interacting with impacted soils and waters • Dunn Creek is ephemeral in nature until the discharge point into where Dunn Creek mixes with waters in Callide Dam. Samples from this location (SW36) have not reported detectable concentrations of PFAS.

Source	Migration Pathways	Receptor(s)	Considerations / Comments
Migration Pathways – Offsite (Surface Water)	Offsite migration of PFAS via surface water flow is considered to occur as follows: • Regional surface water flows (including from Callide Power Station and southern portions of the mine) drain towards Callide Creek. • Surface water within Callide Creek flows from east to west. When the aquifer is comparable to the level of Callide Creek (water level high), water will continue as surface water to downstream catchments (bypass flow). When the aquifer is below the level of Callide Creek, surface water will infiltrate into the aquifer. • Callide Creek is generally considered to be losing (surface water infiltrating to groundwater), however in some sections groundwater may discharge to surface water when the underlying aquifer is full (gaining). The current and historical mass and flux of PFAS in surface water is considered to be highly variable, and influenced by release of PFAS from source areas (historical releases higher than current releases), rainfall within the catchment, water released from Callide Dam and the condition of the underlying aquifer. Appendix G of the EE CLID summarises key PFAS migration pathways for surface water.	The receptors associated with the offsite surface water migration pathways include: • Incidental ingestion and dermal contact exposure pathway for recreational users in surface waters (Lake Callide and Callide Creek) • Human consumption of edible aquatic biota caught from Lake Callide or Callide Creek • Landholders utilising waters from Callide Creek for irrigation of consumable products and subsequent ingestion (i.e. poultry, vegetables, cattle) • Aquatic organisms in direct contact with waters impacted by PFAS • Higher order terrestrial / avian organism consuming aquatic organisms from Callide Creek	• Surface water results were reported below the recreational guideline values indicating risk is likely to be low to recreational water users • Surface water use for irrigation is likely to be limited, with only a minority of landholders identified abstracting water from Callide Creek • Concentrations of PFAS reported in Callide Dam were reported below the laboratory's LOR, however results indicate PFAS is discharged to Callide Dam via the Dunn Creek catchment which could potentially be present in biota. • Offsite concentrations of surface water reported below the 95% species protection limit, and sediment below the ecological direct and indirect exposure criteria, as such direct ecological exposure is likely to be low risk • Based on current advice from the DAF, there is no evidence to suggest PFAS has a detrimental effect on stock health at levels likely to be found in contaminated areas.
Migration Pathways – Offsite (Groundwater)	Within the Callide Creek alluvium, concentrations of PFAS are variable, but present throughout the offsite investigation area. Water movement within the Callide Creek Alluvium occurs at a rate of 4.2 m/day, with water moving from east to west and expanding (north-south) with the aquifer. Since the commissioning of Callide B Power Station, groundwater may have moved up to 17 km down the Callide Valley. Migration of PFAS is considered to mirror water movement, however migration of	The receptors associated with the groundwater offsite migration pathways include: • Incidental ingestion and dermal contact exposure pathway for recreational users in water sourced from groundwater (i.e. swimming pools)	• Groundwater water results were reported below the recreational guideline values indicating risk is likely to be low to recreational water users • Where groundwater has been identified above the drinking water criteria, and is currently being used

Source	Migration Pathways	Receptor(s)	Considerations / Comments
	PFAS will occur at a slower rate. A number of mechanisms are considered to have influenced the current distribution of PFAS within the aquifer. These include: • Current and historical releases of PFAS from Callide Power Station, and other potential PFAS sources. It is noted that the current mass of PFAS entering the alluvium is considered to be lower than historical volumes, and will continue to decrease with time following cessation of AFFF use and remediation of primary source areas. • Recharging of the aquifer by surface water is likely to dilute PFAS within central areas of the alluvium (along the alignment of Callide Creek). The higher concentrations along the northern and southern margins of the aquifer are considered to represent the longer-term background concentrations prior to the commencement of surface water releases from Callide Dam which commenced in 2010. The current mass of PFAS within the Callide Creek Alluvium (between Callide Power Station and Jambin-Dakenba Road) is estimated to be 6.8 kg. Appendix G of the EE CLID summarises key PFAS migration pathways for surface water.	• Landholders utilising extracted groundwater for irrigation of consumable products and subsequent ingestion (i.e. poultry, vegetables, cattle) • Human consumption of untreated groundwater for drinking water • Plant uptake from shallow groundwaters within the alluvial aquifer	for drinking water, CS Energy are providing alternate water supply solutions including supply of bottled water, town water and/or installation/upgrade of rainwater collection tanks. • Based on current advice from the Department of Agriculture and Fisheries (DAF), there is no evidence to suggest PFAS has a detrimental effect on plant health at concentrations found in groundwater offsite. • Based on current advice from the DAF, there is no evidence to suggest PFAS has a detrimental effect on stock health at levels likely to be found in contaminated areas.

4 SUMMARY OF IDENTIFIED DATA GAPS

Based upon the results of the CLID, seven data gaps were identified at the conclusion of the investigation. These data gaps are summarised in **Table 7**. Current investigations are underway to address the data gaps 4 to 7, with the proposed scope of works to address gaps 1 to 3 and supplement the investigations for data gaps 4 to 7 are detailed in this addendum SAQP.

Table 7. Identified Data Gap and Proposed Actions

Data Gap	Details	Addressed by Existing/ Ongoing Scope of Work?	Additional Works Proposed to Address Data Gaps	Additional works detailed in this SAQP?	Other works currently being undertaken outside of this SAQP
1.	Results from soil and sediment investigations at AD4 indicate that a localised source of PFAS may be present within AD4. Further investigation will be required to determine the nature and extent of potential impacts at AD4.	**No**	Proposed works detailed in **Section 6.2**, including: • Site history review to confirm the nature of wastes disposed in AD4 and disposal locations where applicable (refer historical image review in **Section 4.1.1**) • Further investigation at AD4 to confirm the nature and extent of PFAS impacts identified in soil and sediment	✓	• NA
2.	Soil investigations completed at Callide A indicate a localised PFAS impact may be present within the catchment of the NSP, with elevated concentrations of PFAS reported in soils (coal ash/dust) within the northern sediment pond along with surface water. Further investigation will be required to determine the nature and extent of potential impacts at the Callide A NSP	**No**	In addition to the current works being undertaken including ongoing surface water sampling (discussed in **Section 6.4**), the following works are proposed (discussed in **Section 6.3**) • Further soil investigation around catchment of NSP, targeting coal stockpile area, delineation of impacts within NSP • Possible installation of groundwater well adjacent to NSP and within any potential migration pathways between NSP and R2 (i.e. within Ash Dam) • Continued sampling from discharges to R2 (seepage and surface water pathways)	✓	• NA
3.	PFAS is reported to be present in Dunn Creek, with results indicating that discharges from the Callide A site (via release point R2) are likely to be contributing to PFAS concentrations, noting limited water is release via R2 and PFAS impacts were also reported in upstream surface water within Dunn Creek (downgradient of the Callide Mine). No PFAS was identified in ash (soil samples) within Ash Dam 2 or the majority of soil samples collected at Callide A, with PFAS reported at R2 likely associated with soil impacts identified at the NSP. Further investigation will be required to confirm the source of PFAS reported within R2.	**Partially**		✓	• Ongoing event based (post rainfall) surface water sampling is being completed across the site, including R2 and locations within Dunn Creek. • The R2 discharge location is currently undergoing an engineering design review to aid in the management of surface water releases from this location.

Data Gap	Details	Addressed by Existing/ Ongoing Scope of Work?	Additional Works Proposed to Address Data Gaps	Additional works detailed in this SAQP?	Other works currently being undertaken outside of this SAQP
4.	Groundwater results indicate that the eastern seepage area likely comprises at least two seepage pathways, one associated with the current seepage pathway and seepage recovery system, and an additional longer pathway associated with fractured rock which includes monitoring well MW32. Further investigation will be required to confirm the nature and extent of seepage pathways at the eastern seepage area.	**Partially**	A geophysical resistivity survey has been completed, with the report recommending intrusive works to assess potential seepage areas. CS Energy have proposed a drilling program to assess seepage pathways (to be delivered independently of this SAQP), with sampling of newly installed investigation and/or recovery wells to be completed. Following completion, new monitoring locations will be included in the ongoing groundwater and surface water monitoring program (discussed in **Section 6.4**). Ongoing monitoring of surface water along the northern site boundary will continue (discussed in **Section 6.4**), with CS Energy investigating potential engineering solutions to enable monitoring of water flows entering the site. Temporary monitoring of surface water flows is proposed as detailed in **Section 6.5**.	✓	• Geophysical resistivity surveys have been undertaken which will inform an intrusive drilling investigation program to refine the understanding of the seepage regime onsite. Following the conclusion of the drilling program the placement of seepage recovery infrastructure will be reviewed and installed groundwater bores sampled as part of ongoing monitoring of PFAS onsite
5.	Groundwater results from the western seepage area indicate some wells, including MW49, may be outside the current groundwater seepage recovery area. In addition, surface water within the western stormwater diversion channel (carrying stormwater from the north) may infiltrate through alluvial soils in the south-western portion of the site, potentially contributing to PFAS impacts in groundwater. Further investigation will be required to confirm the nature and extent of seepage pathways at the western seepage area along with potential contribution from surface water infiltration.	**Partially**		✓	
6.	High concentrations of PFAS have been reported to be entering the northern boundary of the site via surface water, with surface water, groundwater and sediment impacts identified within the northern and western stormwater diversion channels. Further investigation will be required to assess the nature (including mass) of PFAS entering the site via these pathways. It is noted that management of PFAS impacts from these pathways will need to be undertaken in conjunction with remediation and/or management of offsite source areas.	**Partially**		✓	• CS Energy has installed temporary sensors to enable the monitoring of water entering the site along the northern site boundary (**Section 6.5.3**), with engineered solutions currently being investigated • Batchfire (Callide Mine) is currently completing an investigation as part of an Environmental Evaluation Notice. CS Energy will continue to keep

Data Gap	Details	Addressed by Existing/ Ongoing Scope of Work?	Additional Works Proposed to Address Data Gaps	Additional works detailed in this SAQP?	Other works currently being undertaken outside of this SAQP
					Batchfire informed through the completion of both EE programs.
7.	Potential risks to human and ecological health have been identified (refer EE CLID Sections 12.2 and 12.3 respectively). Further assessment of risk will be required to be completed to quantify potential risks to human and ecological receptors. It is noted that biota sampling was presented as Appendix E to the EE CLID.	**Yes**	Completion of proposed biota sampling as detailed in the SAQP (Epic 2022b) is scheduled to be undertaken during the next wet season period (end January 2023).	**X**	• Sampling of offsite landholders is continuing to inform the management of risk to water users. A third round of landowner sampling is currently underway and due to be completed by mid-2023. • Following completion of biota sampling, CS Energy propose to undertake a Human Health and Ecological Risk Assessment (HHERA) to assess potential risks to human health and ecological receptors.

Notes:

- NA – Not applicable

4.1 Data Gap 1 Summary: AD4

AD4 was commissioned in 1979 to service Callide A Power Station, transitioning to service Callide B in approximately 1988. AD4 remains part of the ash/water management of Callide B Power Station. AD4 is located within the WCF (**Figure F1**) and is reported to have had a capacity of approximately 1,200 ML, with the crest of the dam wall located at 239.5 m AHD and a total depth of approximately 10 m. The spillway for AD4 is located at 238.5 m, with surface water and potential seepage discharging to the northern end of the Drains Reclaim Dam (DRD). Notably, the Environmental Authority (EA, EPPR 000536313) for the site authorises the release of ash and effluent to the Waste Containment Facility, where AD4 is located, from the following sources:

- The sedimentation dams
- Effluent from the chemical drains
- Demineralisation and treatment plant
- Callide C blowdown water
- Cooling tower blowdown
- Effluent from chemical cleans
- Washdown waters
- Quantities of oils and petroleum products that will not cause environmental harm
- Dirty drains
- Boiler blowdown
- Blowdown water treatment plant
- Ash dam B seepage pond waters
- Coal plant wastes
- Cooling tower sludges
- Waste ion exchange resins
- Bag filters (and including the bag filters)
- Laboratory drains
- Callide A and B station sewage effluent

The disposal of this material within AD4 could represent a potential source. This intrusive investigation of AD4 was completed through three boreholes (AD401-03) as part of the EE scope of works (Epic, 2022c), with its location shown in **Figure F2**. These bores were placed to target the northern, central and southern ash disposal areas. A summary of the investigation is as follows:

- From the samples collected, one (AD401-0.5) reported concentrations of PFOS (0.0143 mg/kg) above the ecological indirect criteria of 0.01 mg/kg, with Sum of PFOS and PFHxS (0.0155 mg/kg) exceeding the HIL-A criteria of 0.01 mg/kg. Sample AD401-0.5 also reported detection of PFHxA (0.0004 mg/kg).
    - It is understood that areas of AD4, adjacent to bore AD401, are used to dispose road sweeping and vacuum excavation spoil generated from across current operational areas of the site.
    - It was concluded that PFAS concentrations likely to be associated with disposal of other materials/wastes in accordance with EA, rather than impacts within the ash material.
- Results from the sediment collected in drainage channels adjacent to coal stockpile / Coal Plant (upstream) and AD4 (downstream) reported an increase in PFAS concentrations and change in PFAS composition between both locations (**Figure 2**).
    - All results were reported below the adopted assessment criteria of 0.01 mg/kg (Sum of PFOS and PFHxS), however results indicated that a localised source of PFAS may be present within AD4.
    - It was noted that soil investigations reported elevated concentrations of PFAS in the north-eastern corner of AD4, which may be associated with these PFAS detected in sediments. It is also noted that overland flow from the waste oil store and western areas of the Coal Plant can drain towards these drains surrounding AD4.

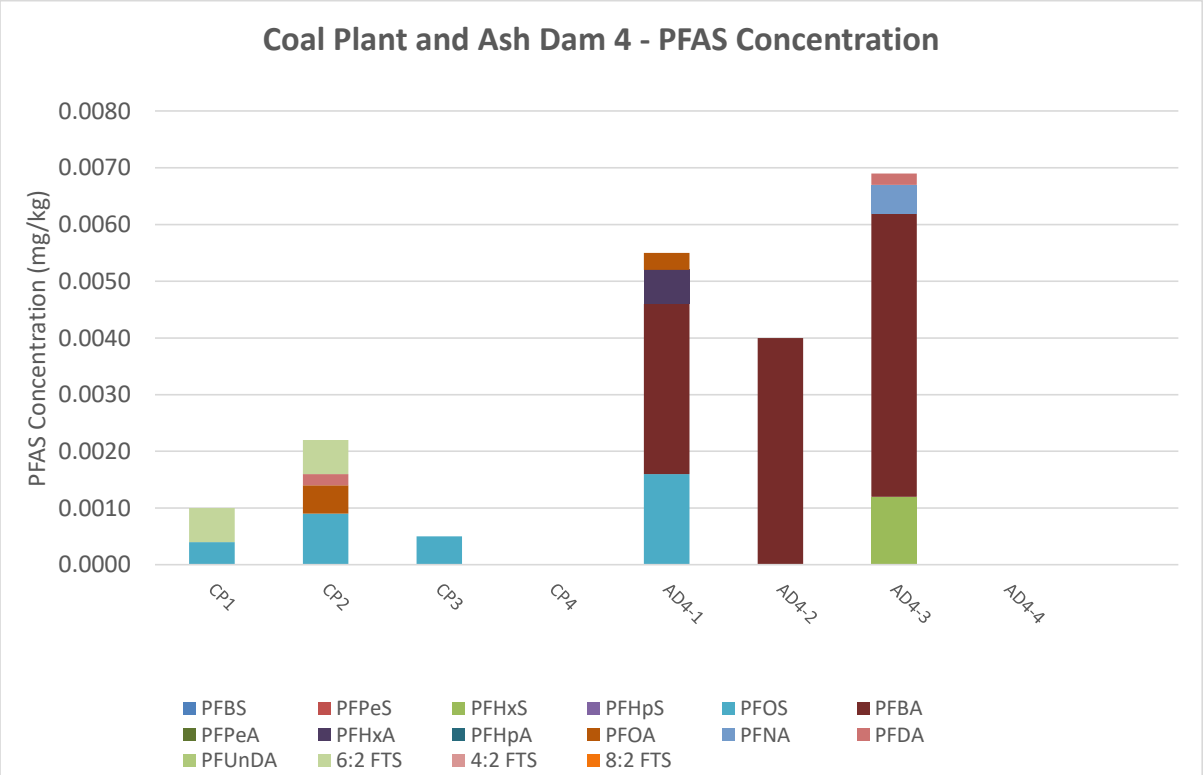


Figure 2. Coal Plant and AD4 – PFAS concentration in sediment (Epic, 2022c)

It was recommended that additional investigation be completed to identify and delineate potential sources of PFAS within AD4. To assist with the identification of areas of interest for additional sampling, a supplementary historical aerial image review was completed of AD4 in **Section 4.1.1**.

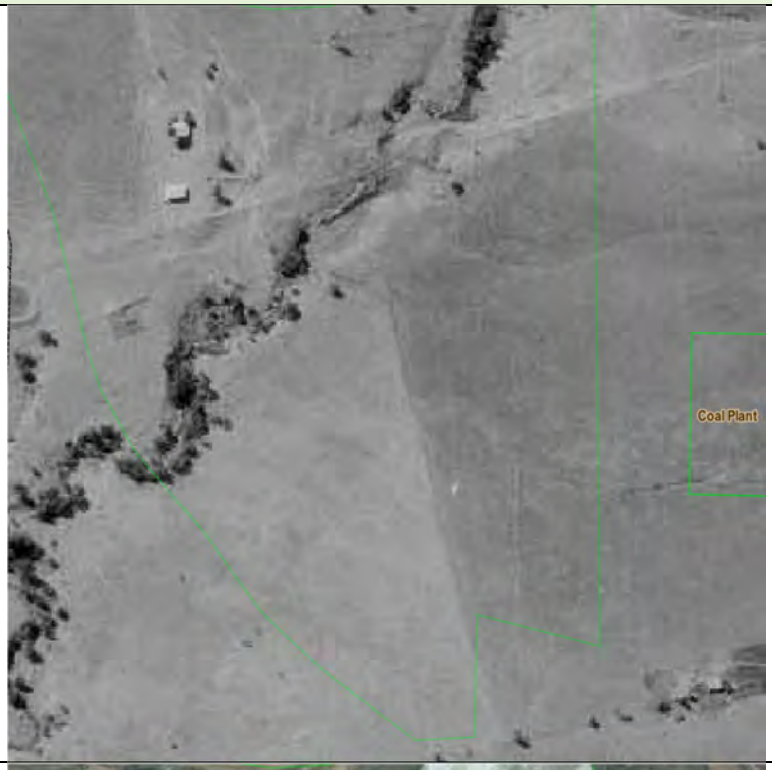
4.1.1 Supplementary Historical Aerial Review: AD4

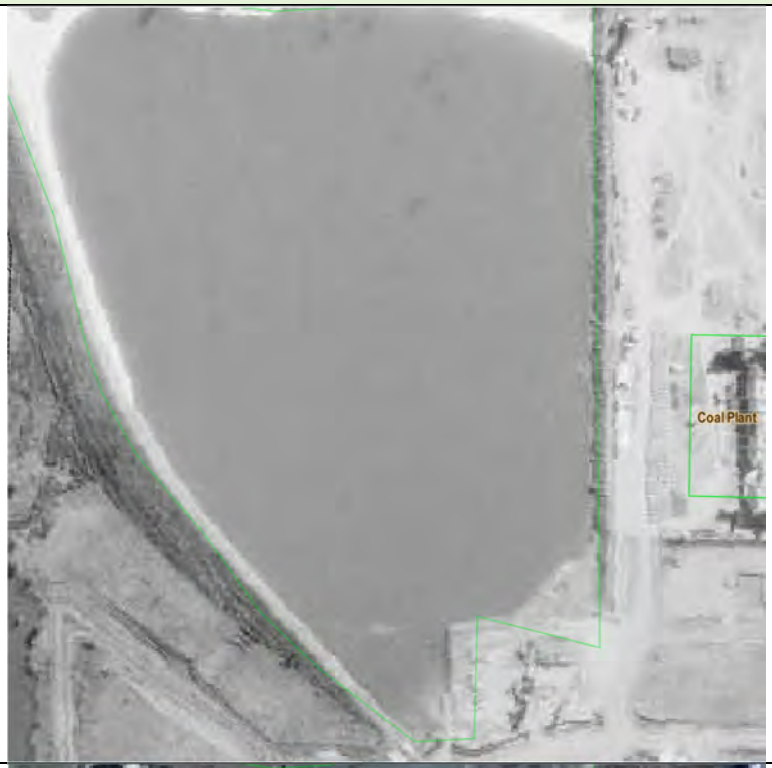
As the filling history of AD4 is unclear, a supplementary historical aerial image review was completed to identify the nature of filling and identify any areas of interest. A summary of this review is presented in **Table 8** with the full historical aerials presented in **Appendix C**.

Based upon this review, the following areas of interest were identified for further investigation:

- AD4 was built over the former alignment of Suicide Gully (imagery from 1977 – 1981)
- Potentially bunded pads (imagery from 1999) filled with a potential slurry of unknown nature
- Nature of material used for the construction of the internal dam wall (imagery from 2004)
- Machinery storage immediately north of the belt conveyor tower (imagery from 2012)
- Potential use of AD4 as a temporary coal stockpile (imagery from 2017) with the potential for spontaneous combustion requiring extinguishment
- Windrowed material stockpiles of a distinct red/orange colour (imagery from 2021)

Table 8. Historical Aerial Review: AD4

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1977		Callide B Power Station has not been constructed. The area prior to the construction of the station is primarily used for grazing with small structures (potential house and shed) located north of the watercourse. The watercourse of Suicide Gully is visible bisecting the area of AD4.
1981		The dam walls associated with AD4 are being constructed with significant amount of earthworks visible to the south and east of the dam. Potential cenospheres are visible floating on the surface along the margins of the dam, potentially from Callide A. The watercourse of Suicide Gully has been filled in and is no longer visible.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1984		Construction of the adjacent areas is continuing and has extended further north. Construction of the coal plant has commenced. A larger volume of water is present within the dam identifiable by the inundation of the northern section of the dam, previously visible.
1988		Construction of the adjacent areas are complete with the belt conveyor and coal plant visible. Potential bottom ash (dark grey) is visible filling the northeastern and eastern margins of the dam, with the lighter cenospheres visible across the surface of the water.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1994		Progressive filling of the dam has continued with the volume of water reduced. A darker coloured material (potentially carbonaceous) is filling the dam in the northern and southern areas.
1999		Filling has continued of the dam, with water confined to the western margin of the dam. Two bunded areas (red) are visible in the eastern area of the dam with an unknown material used to fill the area. Vegetation regrowth across the surface of the filled dam is visible in the north and southern areas.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
2004		Construction of an internal dam wall is visible with earthworks highlighted in red. A belt conveyor extension has been built in the southern corner of the dam, likely associated with the operations at Callide C. The surface area of water has continued to reduce, and a brown discharge is visible from a potential outlet in the southwest corner of the dam.
2012		Filling of the internally constructed dam has continued, likely with ash (grey) and carbonaceous material (black). Vegetation regrowth has continued the top of the ash dam. Machinery and mechanical parts are visible north of the belt conveyor tower (Red). A water course has been excavated in the northern area of the dam.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
2017		Stockpiling of coal is visible in the area of AD4 with black coal visible covering over half the area.
2021		Water course in the northern end of the dam has been filled and has been channelised linking to the remaining water body in the west of the dam. Windrowed stockpiles of soil is visible in the north (red), unlikely to be ash based upon colour.

4.2 Data Gap 2 and 3 Summary: Callide A

Callide A Power Station is located in the north-eastern portion of the site and is located on a small ridgeline that borders Dunn Creek. Ash disposal areas (Ash Dams 1 and 2) are located to the south-west and north-east respectively of the main structure.

Soil sampling completed at Callide A as part of the initial EE investigation (Epic, 2022c) indicate a localised PFAS impact may be present within the catchment of the NSP, with elevated concentrations of PFAS reported in soils (coal ash/dust) within the northern sediment pond along with surface water. These results included:

- No PFAS was identified in ash (soil samples) within Ash Dam 2 or the majority of soil samples collected at Callide A with the exception of CA04, CA10 and CA15 (**Figure F3**)
- PFAS concentrations were above the laboratory's LOR at three locations, CA04 (former pump house), CA10 (laydown area) and CA15 (NSP). A summary of the results includes:
  - Results from CA04 (pump house) reported concentrations of PFOS at the LOR of 0.0002 mg/kg at the surface, with all other compounds reported below the laboratory's LOR, and no PFAS detected in deeper samples. Surrounding samples (CA02, CA05 and CA06) also reported concentrations of PFAS below the laboratory's LOR indicating PFAS detected at CA04 is unlikely to represent a significant source of PFAS.
  - Results from CA10 (Oxyfuel laydown area) reported detections of PFHxA, PFHpA and PFOA, with a total PFAS concentration of 0.0007 mg/kg. Activities completed at the laydown area are unknown, with results indicating minor PFAS impacts may be present. It is noted that surface water sampling completed at the eastern stormwater pond (**Figure 3** and **Figure 4**) (downstream of CA10) reports concentrations of PCAs including PFHxA, PFHpA and PFOA above the laboratory's LOR, along with PFOS and PFHxS.
  - Borehole CA15 was drilled within the NSP, with site observations reporting layers of coal ash/dust approximately 1.0 m deep and assumed to comprise runoff from the adjacent coal stockpile and coal hopper. The 0.5 m sample reported concentrations of PFOS (0.0552 mg/kg) above the ecological indirect criteria and Sum of PFOS and PFHxS (0.0624 mg/kg) above the HIL-A criteria. Site history information (Epic, 2022c) indicates AFFF usage at Callide A was likely to be limited to use of portable foam-type extinguishers (blue band), with results indicating localised PFAS impacts may be present within the catchment of the NSP.
- Surface water concentrations of PFAS were reported to be present in Dunn Creek, with results indicating that discharges from the Callide A site (via release point R2) are likely to be contributing to PFAS concentrations. A summary of the results included:
  - Concentrations of PFAS have been reported in all sample locations within Dunn Creek (SW18, SW17 and SW43), with highest concentrations reported in the upstream sample (SW18) (refer **Figure 4**). Most samples collected within Dunn Creek reported concentrations of PFOS above the 95% species protection limit and concentrations of Sum of PFOS and PFHxS above the drinking water criteria. Concentrations are generally reported to decrease along the alignment of Dunn Creek, with concentrations of total PFAS in upstream surface water (SW18) reported between 0.225 – 0.244 µg/L and downstream surface water (SW42) reporting concentrations between <0.0031 – 0.1250 µg/L.
  - PFAS concentrations within Callide Dam at the mouth of Dunn Creek (SW36) have been reported below the laboratory's LOR during each of the five monitoring events completed. However, it is also noted that LORs have been raised in all samples (PFOS LOR of <0.0008 - <0.00016 µg/L).
  - PFAS has been reported within the Northern (SW44) and Eastern (SW43) Stormwater Ponds, along with the Callide A release point (R2) into Dunn Creek. Concentrations of PFAS at R2 were reported to be variable, however concentrations were lower than those observed downstream in Dunn Creek SW17 when sampling was completed at both locations (Dec21 and Jan22, refer **Figure 4**).
- No clear trend is observed with PFAS compositions (**Figure 3**), however some similarities are observed across events (i.e. SW18, SW17, SW42 and R2 during the December 2021 monitoring event). It is noted that SW44 and R2 were the only locations to report detection of 6:2 FTS (both at 0.002 µg/L, Oct21) which may indicate some linkage between these locations.
  - Surface water has also been noted to accumulate within the voids associated with the coal reclaim hopper (**Figure F3**) which may represent a subsurface migration pathway for impacted waters (if any)

- Groundwater bores installed surrounding Callide A have not reported a sufficient standing water level to facilitate sampling. As such, no data is available regarding the PFAS concentrations in groundwater (if any).

It was recommended that additional investigation be done to determine the nature and extent of potential impacts at the Callide A NSP.

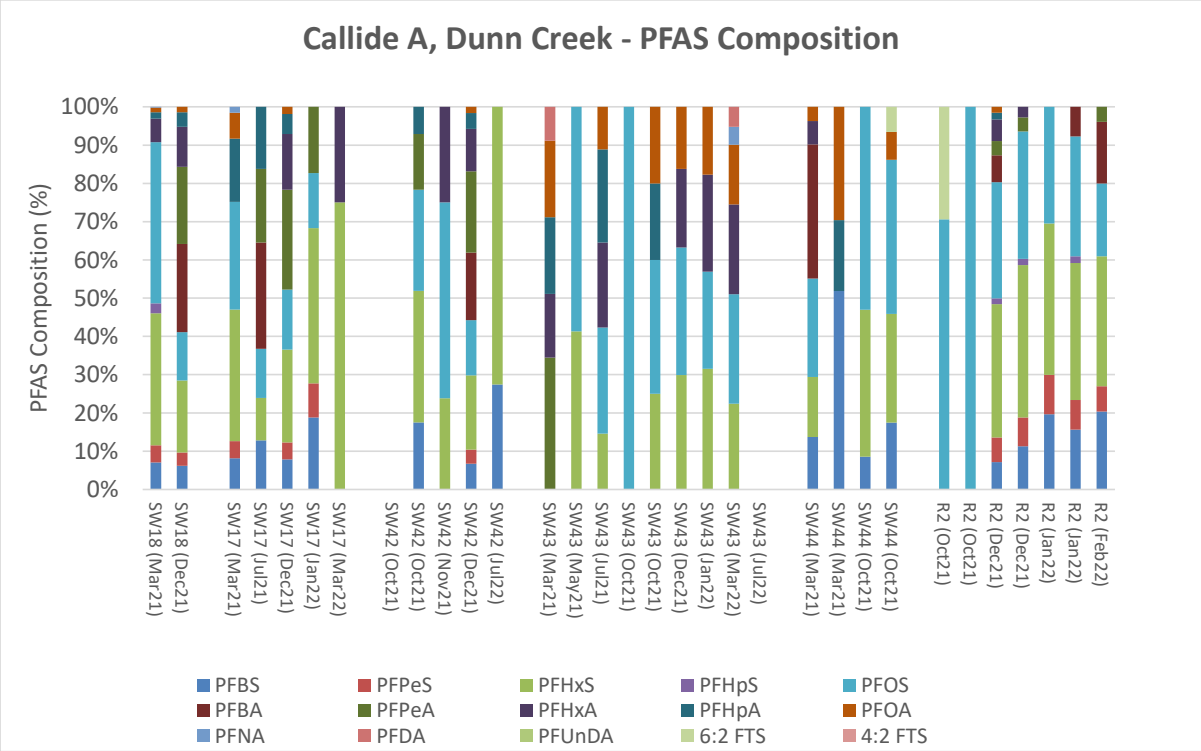


Figure 3. Callide A and Dunn Creek – PFAS Composition

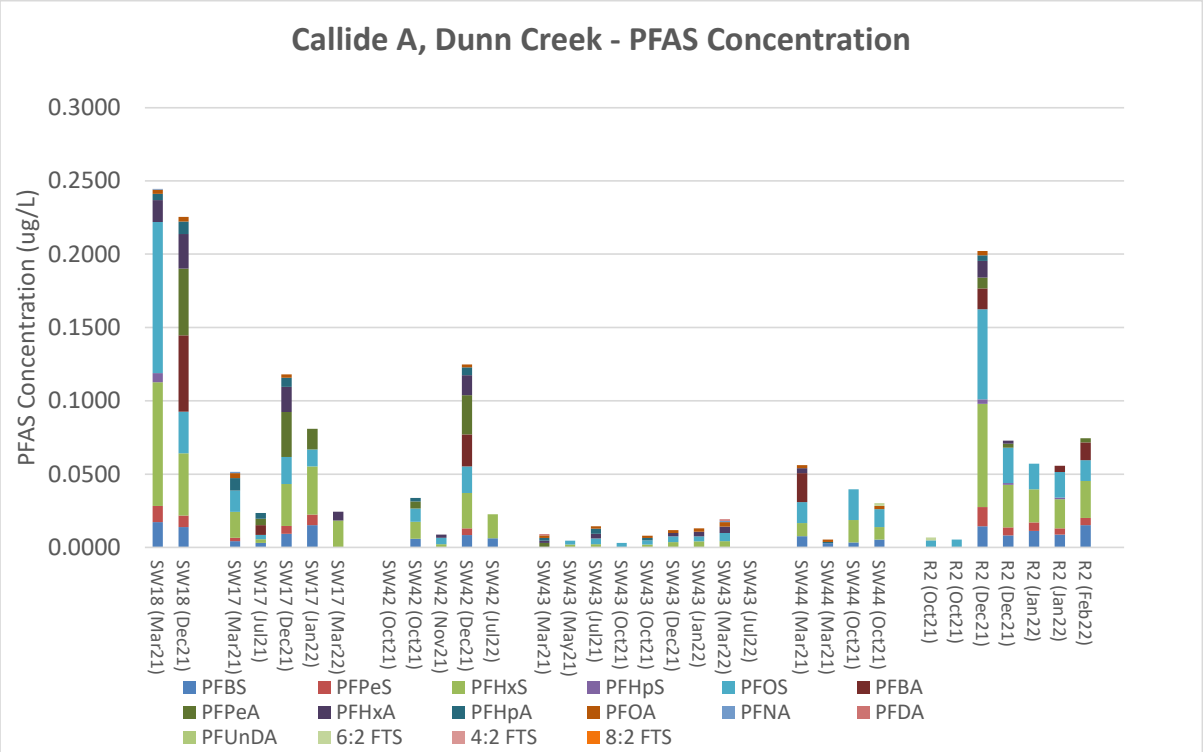


Figure 4. Callide A and Dunn Creek – PFAS Concentration

4.2.1 GHD (2022): Callide A and R2

A site inspection was completed by GHD (2022) of the decant collection system as Ash Dam 2 which discharges to R2. A summary of the findings is presented in **Table 9.**

Table 9. Document Review: Callide A – Ash Dam 2 Investigation and Engineering Plan

Document Title	Technical Memorandum – Callide A – Ash Dam 2 Investigation and Engineering Plan – Preliminary Dam Safety and Environmental Review
Prepared By	GHD
Prepared For	CS Energy
Investigation Site/Area	Ash Dam 2
Date	6 September 2022
Objectives	
The objective of the investigation was to outline the preliminary risks that have were identified from the inspections, desktop reviews and CCTV inspection of the decant system at Ash Dam 2.	
Relevant Findings	
• Significant tree growth and shrubbed vegetation was observed along the upstream and downstream faces of the embankment. • Water overflows from the ESP and NSP via spillways on top of Ash Dam 2. The water is then contained within Ash Dam 2 and should only discharge through R2 if the water level in the Wetland rises to a level where it overtops the decant inlet tower level. When this occurs, the water then passes through the decant system and discharges at R2 (design shown in **Figure 5**). • There was no evidence of seepage from the toe of the dam wall at the time of the inspection • Existing monitoring well (MW21) downgradient of Ash Dam 2, appears to be installed in perched groundwater, that sits above the bedrock and not in the regional groundwater aquifer • The hardstand on which the power station and historically the coal stockpiles were located has been built up and levelled with large boulders in the area between the northern pond and the Wetland. It is possible that these boulders could act as a preferential pathway for surface water in the northern pond to flow directly into	

the Wetland. This is supported by the presence of melaleucas in the Wetland directly down gradient of the northern pond and not in any other areas of the Ash Dam 2.

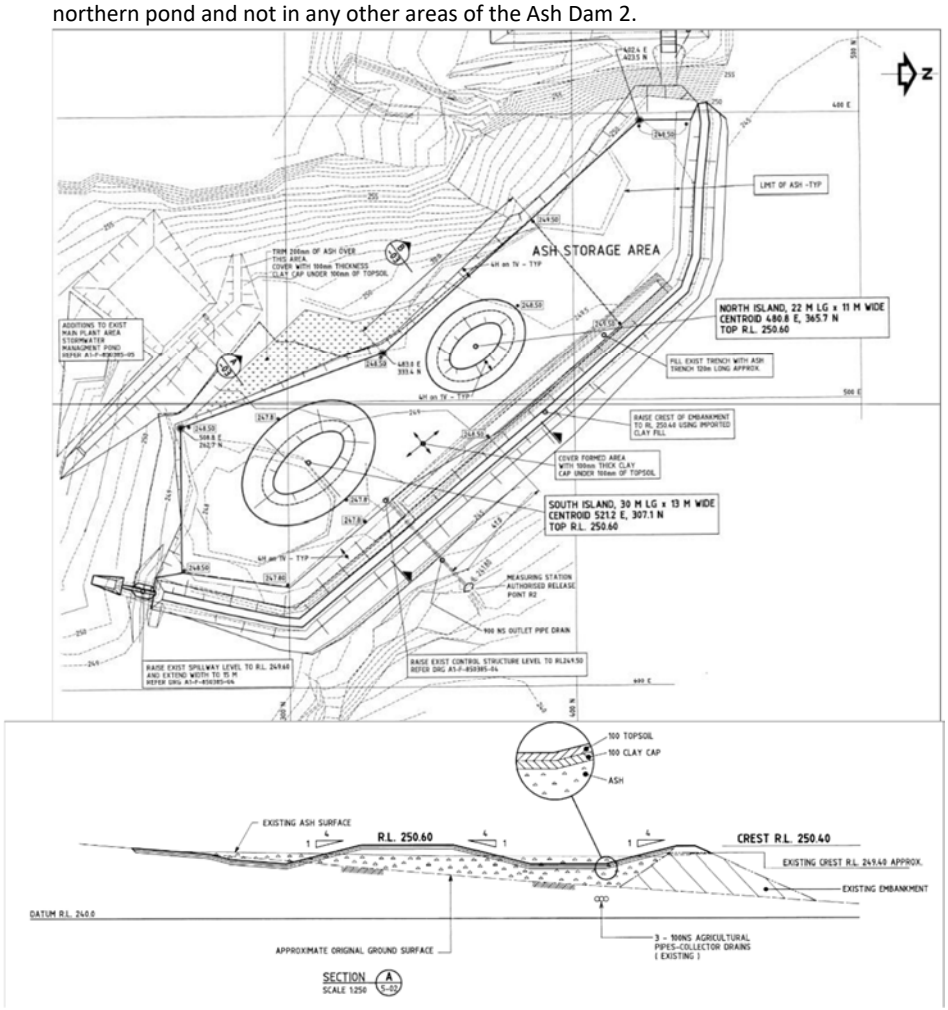


Figure 5. Ash Dam 2 Embankment Rise and Wetland Typical Design (GHD, 2022)

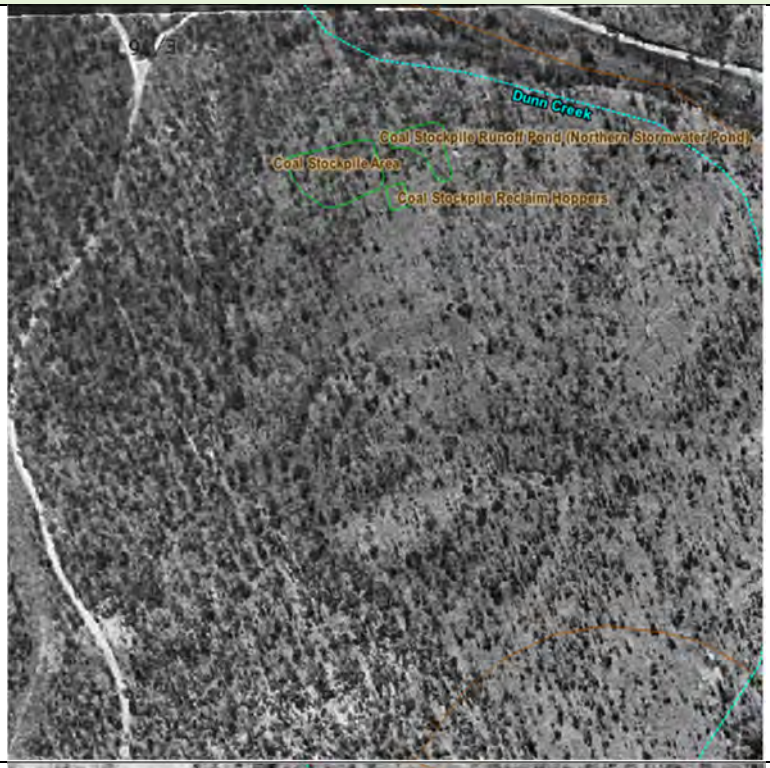
Conclusions and Recommendations

- The desktop review identified that the water quality monitoring in the vicinity of AD2 is generally limited to one surface water sample point (R2) and one groundwater monitoring location (MW21), with the remaining available wells/bores being reported as dry or installed in shallow fill and not representative of the groundwater aquifer.
- The presence and growth of deep tree root systems could damage the pipework or embankments
- A water quality monitoring program is required to understand the conditions surrounding AD2, which is currently proposed to be addressed as part of the works proposed in this SAQP

4.2.2 Supplementary Historical Aerial Review: Callide A

A review of historical aerials was completed of the catchment associated with the NSP. A summary of this review is presented in **Table 10**. The NSP was not visible in photographs prior to 1999, where the area was used for the stockpiling of coal. From this review, areas of interest were identified in (2012) the north-western corner of the site and stormwater channel linking the areas surrounding the ash hoppers with the NSP where white material is visible being washed into the NSP, potentially mobilising impacted material from a historic discharge of a firefighting foam extinguisher into the pond. Additionally, areas of permanent moisture are identifiable in the northern area of Ash Dam 2 (deep rooted vegetation), which may be the result of infiltration from the NSP or spillway discharge from the NSP. These waters would then eventually discharge into R2 through seepage recovery in the ash dam walls, further corroborated with the findings of GHD (2022).

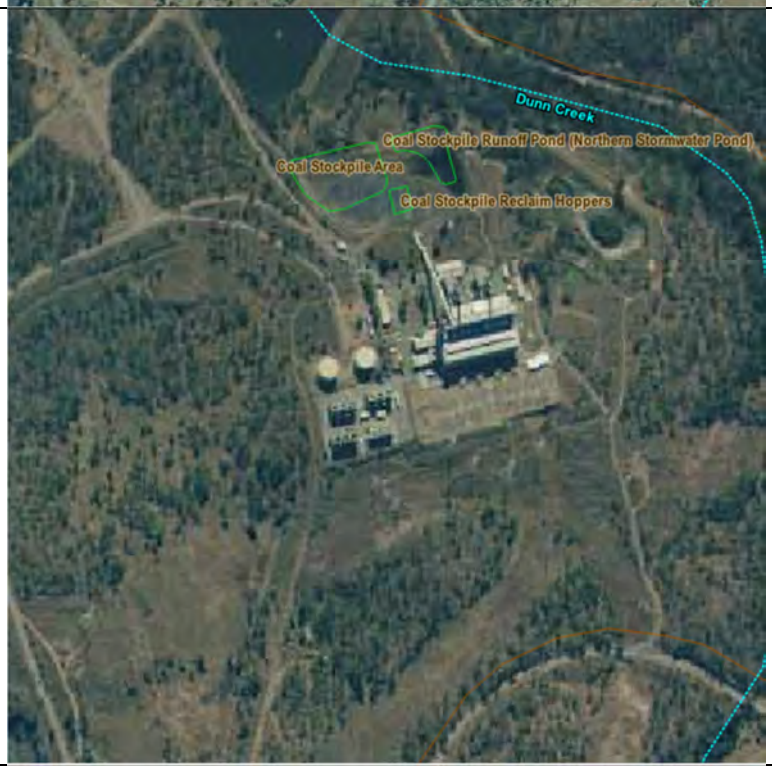
Table 10. Historical Aerial Review

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1958		First available historical image of the site. Area is sparsely vegetated with dirt roads to the north of Dunn Creek and east of the future site.
1965		Callide A Power Station is being constructed with coal loading hopper and NSP visible. Clearing in areas northwest (for the site infrastructure and haul road) and southwest (for the ash dams) is evident from the clearing of trees. Infrastructure in the south of the site (switchyards, water tanks and cooling towers) are still in the process of being constructed.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1973		Shadows from the site smokestacks obscure the areas of interest. Infrastructure in the south of the site has been completed with filling of the ash dam in the southwest with the ash dam wall constructed along the eastern margin of the dam. The walls associated with ash dam 2 have been constructed.
1977		Stockpiles of coal are covering the majority of the coal stockpile area, future NSP and hopper. Pooled water is visible in the ash dam to the east (Ash Dam 2). A haul road is visible entering the area from the northwest of the site with possible dump trucks adding material to the stockpile.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1981		Areas of interest are obscured by smokestack emissions, but the area appears to still be fully covered by coal stockpiles. Site access roads appear to have been sealed. Regrowth across the southwest ash dam has started to occur.
1984		Potentially filling has commenced of the Ash Dam 2 to the northeast of the site, south of Dunn Creek where an outline of possible earthen walls is visible and ponded water in the south-eastern corner of the site. The areas of interest are still covered in coal stockpiles. Equipment and possible trucks are parked in cleared areas to the east of the site (highlighted in red).

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1988		No major changes are visible compared to previous image.
1994		One cooling tower has been removed since the previous image and a reduced number of vehicles and machinery visible in the site. Coal has been removed from the stockpile area. Dunn Creek appears to have been dammed north of the site.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
1999		Stockpile area has been reduced in size and the NSP has been constructed. The ash dam located to the east of the site (Ash Dam 2) has been filled and vegetated. The area is holding water, with the topographic highs visible as islands of the constructed wetlands. A replacement cooling tower appears to have been constructed.
2004		Water in the Ash Dam 2 has been removed / evaporated or the dam filled, with no water visible. Regrowth is visible in the northern end of this ash dam. Additional coal has been removed from the stockpile area.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
2012		Regrowth has occurred in the northern end of the ash dam located in the east of the site not visible in the original rehabilitation visible in 1999. The infrastructure associated with the oxyfuel combustion trials are visible adjacent to the site in the east along with the associated equipment laydown. White material (red) can be seen washing out of the power station facility into the NSP through the drainage channel. Soot or coal dust is visible on the eastern side of the roof of Callide A generator house (enlarged below highlighted in orange) not visible in previous images.

Year	Image With Approximate Location of Site Features	Changes Since Previous Image
2021		Coal has been removed from the stockpile area and removal of cooling towers and infrastructure associated with the oxyfuel trial has been completed. Powerlink switchyard has been removed and the area rehabilitated. Regrowth across the eastern ash dam has continued primarily in the northern end of the dam.

Note:

Areas highlighted are approximate with historical aerial images manually georeferenced against identifiable site features.

4.3 Data Gap 4 to 6 Summary: Groundwater and Surface Water PFAS

Additional data gaps were identified in respect to the groundwater and surface water distribution of PFAS (summarised in **Table 7**). Ongoing monitoring for PFAS has been completed since 2021, with a summary of the results as follows:

- A number of onsite and offsite groundwater results have reported concentrations (or raised LORs) above the 99% species protection limit, generally due to the presence of suspended solids. A summary of the groundwater results included:
  - Based upon TOPA results, it was considered that groundwater in proximity to the site (extending up to approximately 2 km downgradient) may contain an additional mass of PFAS precursors, with groundwater further downstream unlikely to contain an additional mass of PFAS precursors.
  - Groundwater results for background monitoring wells located along the northern (hydraulically upgradient) boundary indicated that groundwater located along the northern site boundary (as represented by MW01 and MW74) is likely to have been impacted from surface water entering the northern site boundary from the area of the mine (operated by Batchfire), which has reported elevated concentrations of PFAS (including SW34 and SW33).
  - Groundwater results for the eastern seepage area reported significant differences in both concentration and composition between onsite wells (MW11, ESC1, ESC3, ESC4, total PFAS up to 0.859 µg/L) and offsite wells (MW31, MW32, MW33 and MW43, total PFAS up to 9.850 ug/L).
    - It was considered likely that the eastern seepage area comprises at least two seepage pathways, one associated with the current seepage pathway/seepage recovery system, and an additional longer pathway associated with fractured rock which includes monitoring well MW32.

  - Groundwater results from the western seepage area reported PFAS composition to be relatively comparable across all monitoring wells, with MW49 reporting a greater proportion of PFHxS and highest concentrations (total PFAS up to 4.67 µg/L, approximately one order of magnitude higher than other wells [total PFAS between 0.22 – 1.01 ug/L]).
    - It was considered likely that surface water within the Western Stormwater Diversion Channel infiltrates through shallow alluvial soils in the southern portion of the site, however current results indicate this is unlikely to be cause of elevated concentrations within MW49, which may have elevated levels due to being located outside of the current groundwater seepage capture area.
- Concentrations of PFAS within the Callide Creek alluvium were reported to be variable (total PFAS between 0.003 – 0.386 µg/L), but present throughout the offsite investigation area, with PSAs (including PFOS and PFHxS) comprising the dominant PFAS group. Detections of PCA and FSA compounds were generally limited to areas upstream of the Dawson Highway (closer to the site). In general, PFAS concentrations decrease with distance from the site, with the composition of PFAS also observed to change with distance from site (higher proportion of PFOS adjacent to the site, with PFHxS becoming the main compound approximately 5 km downstream). As such:
  - The results support the current CSM that the variability of PFAS concentrations were associated with a number of mechanisms including the variability of current and historical releases, variability of aquifer composition and recharging of the aquifer by surface water and releases from Callide Dam which is likely to dilute PFAS within central areas of the alluvium (along the alignment of Callide Creek).

Based upon these results, it was recommended that monitoring of groundwater and surface water should continue at select groundwater and surface water locations across the site and within the study area to provide ongoing assessment of PFAS within key migration pathways (including Callide A/Dunn Creek, the northern and western stormwater diversion channels and the western and eastern seepage areas) and the receiving environment to monitor potential impacts to human health and ecological receptors. Additionally, it was recommended that monitoring should also include monitoring locations which inform the effectiveness of and/or impacts associated with implementation of remediation and management works undertaken at the site.

Additional works are currently underway to provide further characterisation of seepage pathways onsite with the geophysics investigation and associated drilling program being delivered separately to address data gaps 4 and 6, with the proposed works (**Section 6.4**) designed to supplement these ongoing works.

5 DATA QUALITY OBJECTIVES

5.1 Establishing DQOs

The DQO process consists of seven iterative steps, which are designed to clarify the specific project objectives, define the appropriate type of data and inputs required and specify tolerable levels of potential decision errors. Depending on the intended use of the data, there are two types of DQOs:

- Decision making problems – which are addressed by performing statistical hypothesis tests on the collected data
- Estimation problems – which involve using the collected data to estimate some unknown population parameter together with some reported measure of uncertainty in the estimate

These DQOs are estimation DQOs, and the seven steps and associated planning process output is detailed in **Table 11**. These seven steps are:

- Step 1 of the DQO process aims to define the problem that has initiated the study by stating the problem
- Step 2 of the DQO process aims to define the problem that has initiated the study by identifying the goal of the study. Details associated with Step 2 are presented below.
- Step 3 of the DQO process aims to identify the information that will be required to support the decision and specify which inputs require new environmental measurements.
- Step 4 of the DQO process aims to define the spatial and temporal boundaries that the data must represent to support the decisions. Details associated with Step 4 are presented in the table below**.**
- Step 5 of the DQO process aims to define the statistical approach by developing a logical "if …, then …, else …" statement that defines the conditions that would cause the decision maker to choose among alternative actions.
- Step 6 of the DQO process aims to specify probability limits for false rejection and false acceptance decision errors.
- Step 7 of the DQO process aims to identify a resource effective sampling and analysis design for generating data that are expected to satisfy the DQOs.

Table 11. Summary of DQO aspects of proposed investigation

Aspect	Detail
STEP 1 *Describe the problem, develop a conceptual model of the environmental hazard to be investigated, and identify the general type of data needed.*	• PFAS was detected within groundwater and surface water at the site boundary and in downstream monitoring locations up to approximately 10 km downstream of the site, with some locations reported to exceed the Australian Drinking Water Guideline for PFOS + PFHxS. • DES issued an EE notice requiring CS Energy to commission an environmental investigation to determine the nature and extent of impact arising from any direct or indirect release of PFAS from the historical use of AFFF at the site. • As part of the EE site investigation works completed to date, PFAS has been identified in AD4 and in the Callide A NSP. The source, extent and nature of these detections were not able to be determined, requiring additional data to be collected. • PFAS in groundwater and surface water bodies were identified across the investigation area, requiring additional investigation be completed to facilitate an update to the PFAS flux model across the site.
Establish the planning team and identify the team's decision makers.	• Works are to be undertaken by a Suitably Qualified Person (SQP) in accordance with the requirements of the EE Notice. Details on the project team are outlined in **Section 1.3**.
Develop/refine the conceptual site model (CSM).	• A summary of the site wide CSM is presented in **Table 6.** Development of the CSM is detailed further the CLID (Epic, 2022c)
Define the exposure scenarios.	• PFAS is extremely soluble and highly mobile in water, consequently surface water and groundwater flow are important transport mechanisms for PFAS compounds. Potential water flow and contaminant transport from the site to the surrounding environment was likely dominated by surface water and groundwater flows.

Aspect	Detail
	• The primary exposure pathways associated with human health was ingestion, associated with primary surface water and groundwater pathways (including drinking water) and secondary pathways through the consumption of impacted produce and biota. Ingestion of impacted media and to a lesser extent dermal contact and inhalation pathways were considered to be limited.
Discuss alternative approaches to investigation and solving the problem.	• A notice to conduct or commission an environmental investigation was issued in accordance with Section 326B of the *Environmental Protection Act 1994*. All works detailed in the EE and the subsequent amended notice are required to be completed.
Identify available resources, constraints, and deadlines associated with planning, data collection, and data assessment.	• A CLID (site investigation report) was prepared to address the requirements of the initial EE and delivered to DES on 7 September 2022 • Based upon the identification of data gaps (**Table 7**) an extension was issued by DES with the final EE CLID required for delivery to DES by 1700 on 13 October 2023 • It is noted that multiple investigations have been completed or are currently ongoing to address the full requirements of the EE (detailed in **Table 7**). Further to this, several aspects relevant to the EE are to be completed outside of investigations detailed in this SAQP (refer **Table 7**).

STEP 2:
 	
Identify the principal study question(s).
	• The principal study questions for this sampling plan are:
	  • What is the source of PFAS detected in AD4 (Data Gap 1) and at Callide A within the NSP Catchment (Data Gaps 2 and 3)
	  • What is the nature and extent of PFAS contamination at the site, including areas identified to comprise an existing data gap
	  • What are the likely pathways associated with PFAS contamination at the site to other areas of the site, surface waters, drainage lines, stormwater infrastructure and groundwater (Data Gaps 4, 5 and 6)?
	  • For pathways identified, what is the nature of the connectivity/completeness of these pathways and relative contribution to site mass flux of PFAS?
	  • What are the potential risks to human and ecological health including aquatic biota

Define alternative actions that may be taken based upon the range of possible outcomes that result from answering the principal study question.	• Where data gaps are unable to be resolved, further investigation to be completed to inform and close out relevant gaps • Where PFAS contamination has been identified at the site, options for remediation / management can be established. • Where environmental harm is not identified ongoing monitoring of relevant media can continue in accordance with site licencing requirements and include identification and reporting (if required) of any trends or changes in site conditions.
Combine the principal study question and the alternative actions into a decision statement.	• If investigations are unable to close identified data gaps, further investigation will be completed to be completed to inform and close out relevant gaps. • If investigations indicate that direct or indirect releases of AFFF resulted in measurable impact to soil, sediment, surface water, groundwater and/or biota, actions required to prevent or minimise any further releases of contaminants and options for remediation of impacts will be required to be established. • If investigations indicate that direct or indirect releases of AFFF have not resulted in measurable impacts to soil, sediment, surface water, groundwater and/or biota, the previously developed CSM (Epic, 2022c)will be reviewed and updated, with further recommendations made where applicable in the main report.
Organize multiple decisions into an order of sequence or priority.	N/A
STEP 3: *Identify the information that will be required to resolve the decision statement and determine the sources for each item of information identified.*	The following existing information was utilised in resolving the decision statement: • Information on current and historical site activities as detailed in **Section 3** and the completed CLID (Epic, 2022c). • Results from previous PFAS investigations completed at the site summarised in the CLID (Epic, 2022c). • Hydrogeological information available for the site and receiving environments detailed in the CLID (Epic, 2022c).

Aspect	Detail
	• Groundwater and surface water levels, chemistry, connectivity, hydraulic conductivity and velocity. • Review of the representativeness of monitoring locations to assess potential sources along with potential impacts to identified receptors. • Review of GHD (2022) investigation into the integrity of Ash Dam 2. New/Additional Information: • Identification of all potentially impacted media (including groundwater, surface water, soil) within the nominated study boundary • Update of potential pathways between potentially impacted media and human and ecological receptors • Confirmation of PFAS contamination through sampling and analytical testing by a NATA accredited laboratory (as applicable) to be completed on all media for PFAS (standard suite of 28) to the lowest laboratory limit or reporting • Leachability assessment of soil and sediment samples (as applicable) • Analysis of samples for additional laboratory analytical methods including physicochemical parameters and cations/anions to enable comparison of and between aquifers and surface water bodies • Potential impacts/contributions from adjacent land uses including groundwater and surface water impacts from the Callide Mine and surface water releases from Callide Dam • Sampling and analysis of aquatic biota within Callide Creek and associated waterways

Identify the information needed to establish the action level.	The adopted action levels were detailed in the original SAQP (Epic, 2022b) and was based on environmental guideline values detailed within the following guidelines:
	• PFAS NEMP, including
	  • Table 1. Human health guideline values
	  • Table 2. Human health investigation levels for soil
	  • Table 3. Ecological guideline values for soil
	  • Table 4. Biota guideline values
	  • Table 5. Ecological water quality guideline values (freshwater)
	• NHMRC Guidance on Per and Polyfluoroalkyl substances (PFAS) in Recreational Water (2019)

Confirm that appropriate analytical methods exist to provide the necessary data.	Proposed analytical testing and detection limits will be consistent with the previous sampling events. Laboratory analysis will be completed by Australian Laboratory Services (ALS) (primary laboratory) and Eurofins MGT (Eurofins) (secondary laboratory). Both laboratories are NATA accredited for the analytical testing proposed. All analytical procedures used by the laboratories were in accordance with established internationally recognised procedures such as those published by the United States Environmental Protection Agency (USEPA), American Public Health Association (APHA) and relevant Australian Standards/New Zealand Standards (AS/NZS).
STEP 4 *Specify the characteristics that define the population of interest.*	Onsite investigations will be limited to within Lots 1 RP615528 and 4 SP103557 which form the current Callide Power Station site. Areas of interest for this supplementary investigation includes: • Callide A • AD4 • Seepage recovery areas adjacent to Ash Dam B Offsite investigation areas include areas immediately surrounding the boundaries of the site and included areas within Dunn Creek and Callide Creek. Investigation areas along the alignment of Callide Creek will continue to include public and private lands extending to Jambin Dakenba Road, approximately 10 km west of the site. Aquatic biota sampling will be completed within Callide Creek (including Callide Dam and upstream areas), with reference sampling to be completed within Kroombit Dam (adjacent catchment).

Aspect	Detail

Define the geographic area and media to which the decision statement applies.	• Assessment of groundwater was limited to existing groundwater monitoring and abstraction wells including:
	  • CS Energy groundwater monitoring wells
	  • Department of Regional Development, Manufacturing and Water (DRDMW, formerly DRNME) monitoring wells
	  • Private groundwater abstraction bores
	• Assessment of surface water will be limited to existing onsite surface water bodies along with areas of Callide Creek and Dunn Creek within the investigation area
	• Assessment of soil (including ash) will be limited to Callide A and AD4 within the boundaries of the site
	• Aquatic biota sampling will be completed within Callide Creek (including Callide Dam and upstream areas), with reference sampling to be completed within Kroombit Dam (adjacent catchment)

When appropriate, divide the populations into strata that have relatively homogenous characteristics.	• Assessment of groundwater will target the uppermost aquifer identified beneath the site. • Assessment of surface water will include onsite water bodies and existing environmental monitoring locations within Callide and Dunn Creeks. These will then be divided based upon onsite catchments. • Assessment of soil will target both fill and natural soil profiles. Investigation will not be completed within underlying rock profiles. • Aquatic biota sampling will be completed in accordance with the existing Sampling Plan, targeting species of different trophic levels to inform risks to human and ecological health.
Determine the time frame to which the decision applies.	The findings of the proposed SAQP addendum works will be required to be submitted 13 October 2023 (EE Requirement 8).
Determine when to collect data.	Implementation this SAQP will be undertaken as a number of separate monitoring/sampling events. It should be noted that some scope of works have already commenced or are a continuation of the previous SAQP program (prior to issue of the SAQP), including aquatic biota sampling.
Define the scale of the decision making.	The results collected during investigation, in addition to previous information determined to be appropriate, will inform the principal study questions nominated above, and determined whether further works/actions are required to be completed.
Identify any practical constraints on data collection.	Data collection will be limited by a number of factors including: • Site operational considerations which could limit access to monitoring locations, including exclusion zones and existing above and below ground infrastructure. • Access to monitoring locations can be limited due to weather or natural events including rainfall/flooding or storms. • Subsurface conditions could limit the vertical extents of the investigation (refusal on rock). • Potential travel restrictions associated with public health orders.
STEP 5 *Specify the statistical parameter that characterises the population of interest, such as mean, median, maximum or proportion, etc.*	Analytical results will be compared against the adopted assessment criteria to provide an indication of whether potential or actual environmental harm could occur. In addition, analytical results will be utilised to enable comparison of and between soil, sediment, groundwater and surface water (where applicable) to assess representativeness and reliability of monitoring locations along with potential linkages between media. To ensure statistically significant data sets account for seasonal/temporal variations, additional assessment works will be completed from existing established monitoring locations. Data collected from established monitoring locations will result in a more statistically robust data set, with new locations sampled to provide preliminary/indicative information to inform potential sources and/or impacts.

Aspect	Detail
Specify the action level for the decision.	Analytical results will be compared against the adopted assessment criteria**.** It should be noted that in accordance with the NEMP, a higher level of protection has been adopted (i.e. 99% species protection for slightly-moderately disturbed systems instead of 95% species protection) due to the bioaccumulative nature of PFAS, in the absence of biota sampling (scheduled to be completed early 2023) and completion of a site specific detailed risk assessment. Field QA/QC will be completed in accordance with the proposed QA/QC plan as outlined in **Section 6.9**.
Confirm that measurement detection will allow reliable comparisons with the action level.	All analysis will be completed to the lowest practicable limit of reporting (LOR). Analysis of groundwater and surface water will be completed using Super-Ultra Trace methods (0.0002-0.0005 µg/L) to achieve LORs below the 99% Species Protection limits. It is noted that some samples reported elevated LORS due to sample turbidity which is expected to continue through future sampling events.
Combine the outputs from the previous DQO steps and develop a decision rule.	If laboratory results report concentrations above the adopted assessment criteria, then, further assessment will be completed to determine the nature and extent of any impact (where it was not already defined). If field and laboratory QA/QC data report results within acceptable ranges, then, analytical data will be considered suitable for interpretative use.
STEP 6 *Specify the decision rule as a statistical hypothesis test.*	The Null hypothesis (H_O) is that that concentrations of PFAS associated with the direct or indirect release of AFFF resulted in concentrations that exceeded the adopted assessment criteria and/or has resulted in environmental harm. The Alternative hypothesis (H_A) will be that concentrations of PFAS are below the adopted assessment criteria and/or have not resulted in environmental harm.
Examine consequences of making incorrect decisions from the test.	False rejection or Type I error of determining the site is not causing environmental harm when it is (wrongly rejects a true H_O). Consequence will be potential risks and ongoing harm to human health and/or the environment. False acceptance or Type II error of determining the site is causing environmental harm when it is not (wrongly accepts a false H_O). Consequence is unnecessary expenditure and implementation of actions to prevent or minimise further harm and/or manage identified risks.
Place acceptable limits on the likelihood of making decision errors.	The acceptable limits on decision errors will be applied for the implementation of these works, and the manner of addressing possible decision errors are to be developed based on the Data Quality Indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness**.** The potential for significant decision errors will be minimised by: • Assessing whether appropriate sampling and analytical density and representativeness are achieved • Completing a robust QA/QC assessment of the field and laboratory data and application of the probability that 95% of data that satisfied the DQIs, therefore a limit on the decision error will be 5% that a conclusive statement may be incorrect • Ensuring the assessment criteria adopted is appropriate • Sufficient mass/volume of sample media is collected to achieve the lowest possible LORs • Laboratories holding NATA accreditation are used for the analytical methods adopted • The potential for significant decision errors are to be minimised by completing a robust QA/QC program and an environmental assessment that has an appropriate sampling and analytical density for the purposes of the assessment in which representative sampling was undertaken and appropriate sampling methodologies which are to be employed by trained and experienced field personnel

Aspect	Detail
STEP 7 *Document the final sampling and analysis design, along with a discussion of the key assumptions underlying this design.*	Details of the identified data gaps are detailed in **Section 4**, with details and justification of proposed sampling detailed in **Section 6**.
Detail how the design should be implemented, together with contingency plans for unexpected events.	Details of the of the proposed sampling and analysis design are detailed in **Section 6**.
Determine the quality assurance and quality control (QA/QC) procedures that would be performed to detect and correct problems to ensure defensible results.	QA/QC procedures which are to be adopted for field and laboratory aspects are outlined in **Section 6.9**.
Document the operational details and theoretical assumptions of the selected design in the sampling, analysis and quality plan (SAQP).	Operational details and design elements are detailed in **Section 6**. These are taken from the SAQP prepared for the initial phases of the project (Epic, 2022b)

6 PROPOSED ADDITIONAL INVESTIGATION

6.1 Objective

The objective of these proposed works is to address the identified data gaps discussed in **Section 4.** It should be noted that additional works are currently being completed in conjunction with those proposed in this SAQP and are detailed in **Table 7**.

6.2 Data Gap 1: AD4 Investigation

As a potential source of secondary PFAS has been identified in AD4 (**Section 4.1**) additional works are proposed to identify (if any) and delineate the source of these concentrations. To address this data gap, the following additional scope of works are proposed:

- The advancement of additional drill holes consisting of:
  - Four (4) additional locations north of the current stormwater channel to characterise filling of the historic Suicide Gully
  - Two (2) additional locations advanced between AD401 and AD402 to delineate the concentrations detected in AD402
  - Two (2) location advanced within the area of windrowed stockpiled (2021) identified in the historical aerial imagery review (**Section 4.1.1**)
  - One (1) location advanced in the western area of AD4 to provide additional characterisation
  - One (1) location advanced within the area formally used for storage of machinery (2012) identified in the historical aerial imagery review (**Section 4.1.1**)
  - Two (2) locations advanced within potentially bunded area identified in the 1999 historical aerial imagery review (**Section 4.1.1**)
- The analysis of two (2) samples per location (nominal) for PFAS, with the analytical schedule discussed in **Section 6.7**

The proposed locations for these additional locations are shown on **Figure F2** and will be advanced to a maximum depth of 10 m below ground level (mBGL). The proposed methodology is detailed in **Section 6.5**.

6.3 Data Gap 2 and 3: Callide A Investigation

Due to the presence of PFAS in the NSP and in surface waters associated with R2 and Dunn Creek, additional works are proposed to identify and delineate potential secondary sources (if any) present within the NSP at Callide A (discussed in **Section 4.2**). Additionally, a data gap is present in the understanding of potential connectivity of groundwater (GHD, 2022) within Ash Dam 2. To address this data gap, the following is proposed:

- The advancement of three (3) additional boreholes through the NSP to delineate the extent of PFAS detected during the initial investigation and assess potential migration pathways (i.e. overland flow). Soil samples will be collected as per the methodology discussed in **Section 6.5**.
- The collection of four (4) surface samples from within the flow path and drainage channel identified in the historical aerial imagery review in 2012 (**Section 4.1.1**)
- Installation of three (3) groundwater bores to investigate a potential seepage pathway between the NSP and R2, consisting of:
  - One (1) bore located at the eastern boundary of the NSP
  - One (1) bore located within the area of permanent vegetation present in the northern portion of Ash Dam 2 identified in the historical aerial imagery review
  - One (1) bore located between Ash Dam 2 and Dunn Creek to identify potential seepage bypass (if any)
  - The newly installed groundwater bores will be incorporated with the quarterly monitoring events (See **Section 6.4**) with the analytical schedule discussed in **Section 6.7**
- The collection of two water samples from the coal reclaim hopper

The proposed locations for these additional locations are shown on **Figure F3** and will be advanced to a maximum depth of 6 mBGL, with perched groundwater expected at between 2-4 mBGL within Ash Dam 2.

6.4 Data Gap 4 to 6: Groundwater and Surface Water Monitoring

Based upon the sampling results collected to date, ongoing groundwater and surface water sampling is recommended to continue at the site to provide ongoing assessment of PFAS within key migration pathways and the receiving environment.

The ongoing monitoring program has been broken into several areas of interest associated with key migration pathways/site areas based on the results of the initial EE investigation (Epic, 2022c). These areas of interest are detailed in **Table 12**.

The sampling methodology is summarised in **Section 6.5**, while the analytical schedule is presented in **Section 6.7** and proposed locations are shown on **Figure F4**. A summary of proposed sampling locations for the proposed sampling schedule is included as **Table T1** (quarterly), **Table T2** (seasonal), **Table T3** (annually) and event based (**Table T4**) in the Tables Appendix.

Table 12. Proposed Groundwater and Surface Water Monitoring Program

Sampling Scope	Area of Interest	Sample Locations	Proposed Sampling Schedule				
			Q1 [Feb/Mar23]	Q2 / Dry Season / Annual Event [May/Jun23]	Q3 [Aug/Sep 23]	Q4 / Wet Season Event [Nov/Dec23]	Rainfall Event (>20mm) [A]
Groundwater	Northern Site Boundary	MW74	X	X	X	X	
	Callide A	3 New wells (See **Section 6.3**)		X	X	X	
	Eastern Seepage	MW32 MW42 MW43	X	X	X	X	
		ESC3 ESC4 MW31 MW33		X		X	
	Southern Seepage	MW09 MW78	X	X	X	X	
	Western Seepage	MW40 MW49 MW56 MW68	X	X	X	X	
	Callide Creek	MW72 MW73 MW80	X	X	X	X	
		MW70 MW69		X		X	
	Callide Alluvium	L005-B01 L006-B05 L012-B01 L021-B01 RN13030698 RN13030127 RN13030697 RN13030692 RN13030126 RN13030112 RN13030715	X	X	X	X	

Sampling Scope	Area of Interest	Sample Locations	Proposed Sampling Schedule				
			Q1 [Feb/Mar23]	Q2 / Dry Season / Annual Event [May/Jun23]	Q3 [Aug/Sep 23]	Q4 / Wet Season Event [Nov/Dec23]	Rainfall Event (>20mm) [A]
Surface Water	Callide Dam	SW20		X		X	
	Northern Boundary	SW06 SW33 SW34 SW45 BS3-CWN	X	X	X	X	X
		BS3-CWE BS30-CW					X
	Western Stormwater Drainage Channel	SW48 SW28 Additional locations (west of v-notch 1 and 2)		X		X	X
	Callide A / Dunn Creek	R2	X	X	X	X	X
		SW43 SW44	X	X	X	X	X
		SW18 SW17 SW42					X
	Onsite Water Bodies	DRD PW2	X	X	X	X	X
	Western Seepage Area	SW13		X		X	X
	Callide Creek	SW02 SW12 SW22 SW40	X	X	X	X	X
		SW41		X		X	

Notes:

[A] - event-based sampling is to occur within 72 hours of a rain event >25mm (72 hr) as recorded onsite, with sampling to be limited to one event per month

6.5 Summary of Other Works to Address Data Gaps

6.5.1 Release Point R2 (Data Gap 3)

GHD have been commissioned to undertake dam safety and environmental review of Ash Dam 2 (AD2), and the associated EA licenced discharge location R2. The purpose of the investigation is to identify the key risks presented by AD2 to the environment and license compliance as well as dam safety. The investigation will also consider aspects associated with the detection of PFAS at R2 including surface water and seepage flow paths.

6.5.2 Groundwater Bore Installation Program (Data Gaps 4 and 5)

Based on the findings of the geophysical resistivity survey, CS Energy are proposing to commission a groundwater bore installation program. The recommendations of the geophysical resistivity survey report recommended installation of nine monitoring wells to assess potential seepage pathways. CS Energy's hydrogeologist has reviewed the geophysical survey report and recommended monitoring bore locations and

made recommendation to install thirteen monitoring bores, with bores to be converted to groundwater recovery bores based on the drilling observations and testing.

The bore installation program will target known seepage areas, along with potential additional seepage area (based on the geophysical investigation) to confirm the nature and extent of seepage pathways.

The bore installation program is anticipated to be awarded in the second quarter of 2023.

6.5.3 Northern Boundary Flow Monitoring (Data Gap 6)

CS Energy are currently commissioning the installation of an engineering solution to enable monitoring of water flows entering the site along the northern boundary. The engineering solution proposed includes installation of a v-notch weir, engineered culvert or similar at key watercourses entering the northern site boundary, with dedicated flow monitoring equipment installed to monitor surface water entering the site.

CS Energy have also installed temporary monitoring at existing stormwater culverts at monitoring locations SW33 and SW34. A LoRaWAN LDDS75 Distance Detection Sensor has been installed at each location to provide real time monitoring of water levels within the culverts. Monitoring will be supplemented by collection of regular field measurements (i.e. during/following flow events) to calibrate the sensor readings. Estimate flux volumes will be calculated based on the culvert cross sectional areas and assumptions of flow velocities. Further details on the flow sensors is included in **Appendix B**.

6.5.4 Landowner Sampling Program (Data Gap 7)

CS Energy is continuing their landowner sampling program, which includes sampling of groundwater bores from 84 landowners adjacent to, and downstream of the site. Sampling of landowners commenced in February 2021, with two rounds of sampling currently completed. A third round of landowner sampling is currently underway and due to be completed by mid-2023.

Results from the landowner sampling program, along with water use survey data collected as part of this scope of work and the aquatic biota sampling will be used to inform completion of a HHERA to assess potential risks to human health and ecological receptors.

6.6 Methodology

The proposed sampling methodology for the proposed works detailed in **Sections 6.2, 6.3** and **6.4** are detailed in **Table 13** (soil), **Table 14** (surface water) and
Table 15 (groundwater). Quality assurance and quality control measures are discussed further in **Section 6.9**.

Table 13. Soil Sampling Methodology

Action	Description
Permit to Work	Soil sampling is to be completed under a Site Permit to Work (PTW) and a Digging, Excavation and Building Penetration Checklist. Permits will be obtained in accordance with the CS Energy Permit to Work Manual (CS-PTW-01) and Digging, Excavation and Building Penetration (CS-PTW-HAZ-04) prior to the commencement of works.
Soil Sampling	Soil samples will be collected using a drill rig utilising single-use disposable pushtubes, with drilling terminated at target depth or prior refusal. Soil samples will be collected directly from the pushtube sleeve, directly from the soil surface or from material returned on the hand auger using disposable nitrile gloves, which will be replaced between the collection of each sample. The soil samples will be immediately transferred into laboratory supplied PFAS sampling containers.
Soil Logging	Logging of investigation locations will be conducted in general accordance with the Unified Soil Classification System and AS 1726-1993. Descriptions will be recorded on Epic's standard field log sheets for uniformity in descriptions, presentation and to aid in future interpretations.
Field QA/QC	Field intra- and inter-laboratory duplicates of soil samples will be prepared in the field by collecting blind and split samples from the same depth. Duplicate sample pairs will be collected and analysed at a rate of 1 in every 10 primary samples in accordance with the PFAS NEMP.

Decontamination	Soil sampling will be completed using dedicated disposable equipment (pushtubes) along with a hand auger where access is limited. Reusable equipment will be decontaminated by hand between each sampling location and event which will include scrubbing thoroughly with a plastic brush and rinsing with clean water followed by a triple-rinse in deionised water. Rinsate samples will be collected from reusable equipment to verify effectiveness of the decontamination.

Table 14. Surface Water Sampling Methodology

Action	Description
Sampling Timing	Surface water sampling on a quarterly, seasonal (wet/dry) or annual basis as detailed in **Table 12**. Additionally, event-based sampling is to occur within 72 hours of a rain event >20mm (recorded onsite) to a maximum of one event per month.
Surface Water Depth Monitoring (Northern Boundary)	Monitoring of surface water flowed is being completed through the installation of LoRaWAN Distance Detection Sensor: LDDS75. It will detect the distance between the measured object (water level) and the sensor. This data will be downloaded and corrected for interpretation, enabling an estimation of surface water flow rates.
Surface Water Sampling	Surface water sampling will be conducted using a decontaminated telescopic sampling pole or by directly submerging laboratory PFAS compliant containers into the water body. Samples will be collected into a laboratory prepared sample bottle attached to the pole with the lid open and lowered with the opening facing downwards into the water. Where possible the sample bottle will be lowered to at least 30cm beneath the water surface and at least 30cm from the base of the water body. Care will be taken not to disturb any sediments during this process. The sample bottle will then then rotated so as to sample water from the centre of the water column. Once full, the bottle will be carefully removed and sealed. Water quality parameters recorded in the field will include dissolved oxygen, temperature, EC, redox potential, turbidity and pH, measured using a calibrated water quality meter.
Field QA/QC	Field intra- and inter-laboratory duplicates of the surface water samples will be collected in the field by collecting blind and split samples from the same depth. Duplicate sample pairs will be collected and analysed at a rate of 1 in every 10 primary samples in accordance with the PFAS NEMP.
Sample Labelling, Storage and Transport	All samples will be clearly labelled with unique identification numbers consisting of the date, sample location and samplers' initials. All samples will be bagged and kept in an ice filled Esky prior to dispatch and during transport to the NATA registered laboratory, under chain-of-custody procedures. By prior arrangement with the laboratory, samples will be extracted and analysed as soon as practicable after receipt.
Decontamination	Reusable equipment will be decontaminated by hand between each surface water sampling location. This will include scrubbing thoroughly with a plastic brush and rinsing with clean water followed by a triple-rinse in deionised water. If required, equipment will be scrubbed with a solution of Liquinox (a PFAS approved detergent) followed by a rinse in deionised water.

Table 15. Groundwater Sampling Methodology

Action	Description
Groundwater Bore Installation	Groundwater bore construction will be undertaken by an appropriately licenced driller and be consistent with the Minimum Construction Requirements for Water Bores in Australia (National Uniform Drillers Licensing Committee (NUDLC) 2020).
Aquifer Matrix Sampling	One soil sample will be collected from within the target groundwater aquifer unit from each groundwater bore. Sampling will be completed generally in accordance with **Table 13** (modified based on final drilling method), with analysis to be completed in accordance with **Table 16**.
Groundwater Bore Development	The groundwater bores will be developed using an electric submersible centrifugal pump to remove sediment load and encourage connectivity with the surrounding aquifer matrix. A minimum of five bore volumes will be removed and additional water will be

Action	Description
	removed if physicochemical parameters haven't stabilised [A]. Construction details will be provided in the final report along with bore development data.
Groundwater Bore Surveying	Groundwater bores will be surveyed to enable accurate measurement of standing water levels (SWL) in mAHD and will be completed by a licenced surveyor.
Sampling Timing	Surface water sampling on a quarterly, seasonal (wet/dry) or annual basis as detailed in **Table 12**.
Monitoring Well Gauging	Measurement of the SWL will be completed at each groundwater monitoring well using an electronic interface probe prior to the commencement of purging. SWL will be measured throughout groundwater bore purging to enable the minimisation of drawdown. Due to the pre-existing headworks present on landholder bores (L005-B01, L006-B05, L012-B01 and L021-G01), the SWL will not measured at these locations.
Monitoring Well Sampling – CS Energy and DRDMW wells	Sampling of existing groundwater monitoring wells will be completed utilising appropriate sampling methods based on the findings of the groundwater monitoring network review (Epic 2022c). Sampling methods will include polypropylene HydraSleeves™ or using submersible pump in accordance with the methods outlined below. Sampling methodologies for new groundwater monitoring wells will be determined in accordance with Epic 2022c.
	Sampling of monitoring wells utilising polypropylene HydraSleeves™ will be completed as follows: • Groundwater depth and total well depth will be measured and recorded to determine the appropriate length of bail cord to ensure the HydraSleeve™ is positioned a sleeve-length below the top of the screen interval • The HydraSleeve™ will then be lowered down the well at a slow rate (less than 15cm per second) to avoid water entering the HydraSleeve™ prematurely • The HydraSleeve™ will be left at the depth for at least 24 hours to allow for stabilisation • After the required time to stabilize, the HydraSleeve™ will be recovered by pulling the cord upward at a rate of approximately 30cm per second, allowing the top check valve to open and groundwater within the screened well casing to enter the HydraSleeve™ (the top check valve closes when the HydraSleeve™ is full) • Samples will be collected by transferring the groundwater from the HydraSleeve™ to sample bottles by piercing the sleeve with the provided disposable High Density Poly Ethylene (HDPE) straw • Where suspended solids are observed in the sample, this will be allowed to settle, with sample collected by piercing the sleeve above the settled sediment. Alternatively, sample will be transferred into a suitable laboratory prepared bottle and be allowed to settle before being decanted into a separate laboratory prepared bottle • Samples will be collected directly from the HydraSleeve™ into laboratory prepared bottles. All bottles were sealed immediately using a non-Teflon lined cap (for PFAS), labelled and placed on ice (double bagged).
	Sampling of groundwater monitoring wells utilising low flow techniques will be completed as follows: • The pumps inlet will be set within the groundwater wells screened interval during purging and sampling • Prior to sampling, monitoring wells will be purged using a submersible pump at a rate <1 L/min • Continuous monitoring with an interface probe will be completed during purging and sampling with pumping rates adjusted to ensure minimal drawdown • Purging continued with frequent measurements of the water quality until parameters stabilised • Sampling of the monitoring wells will be completed using the pump and dedicated HDPE tubing following stabilisation [A]. Samples will be collected directly from the tubing into laboratory prepared bottles. All bottles are to be

Action	Description
	sealed immediately using a non-Teflon lined cap (for PFAS), labelled and placed on ice (double bagged). • Where suspended solids are observed in the sample, the sample will be allowed to settle in the laboratory prepared bottle before being decanted into a separate laboratory prepared bottle
	Sampling of groundwater monitoring wells using a submersible pump will be completed as follows: • The pumps inlet is to be set within the groundwater wells' screened interval during purging and sampling • Prior to sampling, monitoring wells will be purged using a submersible pump. Purging continued with frequent measurements of the water quality until parameters stabilised [A] or the well was purged dry. • Sampling of the monitoring wells will be completed using a pump and dedicated HDPE tubing following stabilisation or following recovery (where purged dry). Samples will be collected directly from the tubing into laboratory prepared bottles. All bottles were sealed immediately using a non-Teflon lined cap (for PFAS), labelled and placed on ice (double bagged). • Where suspended solids are observed in the sample, the sample will be allowed to settle in the laboratory prepared bottle before being decanted into a separate laboratory prepared bottle
Monitoring Well Sampling – Private Abstraction Wells	Samples at private wells will be collected as follows: • Samples will be collected directly from the bore pump at the nearest tap or suitable outlet. Prior to sampling the pipework will be purged, with a minimum of one well volume purged (if well volume known) or purging for at least 10 minutes prior to sampling. • Samples will be collected directly from the outlet into laboratory prepared bottles. All bottles are to be sealed immediately using a non-Teflon lined cap (for PFAS), labelled and placed on ice (double bagged). • Where suspended solids are observed in the sample, the sample will be allowed to settle in the laboratory prepared bottle before being decanted into a separate laboratory prepared bottle
Field QA/QC	Field intra- and inter-laboratory duplicates of the groundwater samples will be prepared in the field by collecting blind and split samples from the same depth. Duplicate sample pairs are to be collected and analysed at a rate of 1 in every 10 primary samples in accordance with the PFAS NEMP.
Sample Labelling, Storage and Transport	All samples will be clearly labelled with unique identification numbers consisting of the date, sample location and samplers' initials. All samples will be bagged and kept in an ice filled Esky prior to dispatch and during transport to the NATA registered laboratory, under chain-of-custody procedures.
Decontamination	Reusable equipment, including the water level meter, and groundwater pumps, will be decontaminated by hand between each groundwater sampling location. This will include scrubbing thoroughly with a plastic brush and rinsing with clean water followed by a triple-rinse in deionised water.

Notes:

[A] - Stabilisation determined based on three successive readings within nominated tolerances as adopted from USEPA Low-flow (minimal drawdown) Groundwater Sampling Procedures, April 1996 (ref. EPA/540/S-95/504) including ±0.1 pH, ±3% EC, ±10mv ORP and ± 10% DO.

6.7 Laboratory Analysis

All samples will be submitted to a NATA registered laboratory for analytical testing for PFAS methods (where possible / available) to the lowest available laboratory limit of reporting (LOR) for the specific media. Details on the proposed analytical program is presented in **Table 16**.

Australian Laboratory Services (ALS) has been adopted as the primary laboratory for groundwater, surface water, soil and sediment analysis, with Eurofins MGT (Eurofins) adopted as the secondary laboratory. Both laboratories are NATA accredited for the analytical testing proposed.

All analytical procedures used by the laboratories are in accordance with established internationally recognised procedures such as those published by the United States Environmental Protection Agency (USEPA), American Public Health Association (APHA) and relevant Australian Standards/New Zealand Standards (AS/NZS).

Table 16. Proposed Laboratory Analytical Schedule

Scope	Event Type (As per Section 6.4)	Analytical Suite – Number of Samples			
		PFAS (28 Analyte)	Water[#] / Aquifer Matrix[‡] Characterisation	Total Oxidisable Precursor (TOP) Assay [&]	Leachability – PFAS (28 Analyte) [+]
Groundwater	Quarterly	20 Primary 4 Duplicates	20 Primary 4 Duplicates	-	NA
	Seasonal	28 Primary 6 Duplicates	28 Primary 6 Duplicates	-	NA
	Annually	30 Primary 6 Duplicates	30 Primary 6 Duplicates	-	NA
Surface Water	Quarterly	15 Primary 4 Duplicates	15 Primary 4 Duplicates	-	NA
	Seasonal	21 Primary 5 Duplicates	21 Primary 5 Duplicates	-	NA
	Annually	21 Primary 5 Duplicates	21 Primary 5 Duplicates	-	NA
	Event Based	20 Primary 4 Duplicates	20 Primary 4 Duplicates	-	NA
Soil	Callide A	24 Primary 6 Duplicates	3 Primary	2 Primary	2 Primary
	AD4	26 Primary 6 Duplicates	NA	2 Primary	2 Primary

Notes:

NA – Not applicable

[#] - Water characterisation will include: pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Total Suspended Solids (TSS) Cations and Anions (Ca, Mg, Na, K, Cl, SO4, alkalinity, fluoride), dissolved aluminium (Al), iron (Fe) and manganese (Mn), Ammonia, Nitrate, Nitrite, Reactive Phosphorus

‡ - Aquifer matrix characterisation will include (in addition to PFAS): pH, EC, total organic carbon, Fe and Mn

[&] - Samples to be selected based on results from standard analysis, targeting samples with highest concentrations

[+] - Analysis completed following leachability (ASLP) at pH 7.0

6.8 Assessment Criteria

Groundwater and surface water analytical data will be evaluated against relevant assessment criteria with regards to human health and the environment. The adopted assessment criteria, along with guidance documents used to establish the screening/ investigation levels are summarised in **Table 17**.

Concentrations are to be compared to 99% Species Protection Guideline Values due to the proximity of the site to sensitive environmental receptors including Callide Creek and the potentially bioaccumulative nature of PFAS[1]. Results will also be compared to 95% Species Protection Levels to evaluate likely impacts to environmental values, noting that the 99% Species Protection Levels may be below ambient background concentrations.

[1] NEMP 2018, Table 5: The WQG advise that the 99% level of protection be used for ...slightly to moderately disturbed systems'. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife.

Table 17. Adopted Groundwater and Surface Water Assessment Criteria

Media	Potential Contaminant of Concern	Criteria	Potential Receptor	Description	Guideline Source
Groundwater and Surface Water	Sum of PFOS and PFHxS	0.07 µg/L	Human Health	Drinking Water	• Australian Drinking Water Guidelines 6, 2011 (v3.5 August 2018) • PFAS National Environmental Management Plan (v2.0 January 2020)
	PFOA	0.56 µg/L			
	PFOS/PFHxS	2 µg/L		Recreational Water	• NHMRC Guidance on Per and Polyfluoroalkyl substances (PFAS) in Recreational Water (2019) • PFAS National Environmental Management Plan (v2.0 January 2020)
	PFOA	10 µg/L			
	PFOS	0.00023 µg/L	Ecological	99% species protection	• PFAS National Environmental Management Plan (Freshwater)
	PFOA	19 µg/L			
	PFOS	0.13 µg/L		95% species protection	• PFAS National Environmental Management Plan (Freshwater)
	PFOA	220 µg/L			

Soil results are to be compared against relevant assessment criteria with regards to human health and the environment. The adopted assessment criteria, along with guidance documents used to establish the screening/ investigation levels are summarised in **Table 18.**

Table 18. Adopted Soil and Sediment Assessment Criteria

Media	Potential Contaminant of Concern	Criteria	Potential Receptor	Description	Guideline Source
Soil and Sediment	PFOS/PFHxS	1 mg/kg	Human Health	Public Open Space [offsite soils/ sediments]	PFAS National Environmental Management Plan Soil
	PFOA	10 mg/kg			
	PFOS/PFHxS	20 mg/kg		Industrial / Commercial [onsite soils/ sediments]	PFAS National Environmental Management Plan Soil
	PFOA	50 mg/kg			
	PFOS	1 mg/kg	Ecological	Ecological Direct Exposure	PFAS National Environmental Management Plan Interim Soil
	PFOA	10 mg/kg			
	PFOS	0.01 mg/kg		Ecological Indirect Exposure (Residential) [offsite soils/ sediments])	PFAS National Environmental Management Plan Interim Soil
		0.14mg/kg		Ecological Indirect Exposure (Industrial / Commercial) [onsite soils/ sediments]	

6.9 Quality Assurance and Quality Control Program

The field and laboratory quality assurance and quality control (QA/QC) plans to be adopted for the assessment are detailed below. These have been designed to achieve pre-determined data quality objectives that will be assessed with respect to Data Quality Indicators (DQIs). Achieving the DQIs will demonstrate the precision, accuracy, representativeness, completeness and comparability of the data set and that the data set is of acceptable quality to meet the objectives of the assessment.

6.9.1 Field Quality Assurance and Quality Control

The field quality assurance procedures to be adopted and the field quality control samples to be collected during the assessment and the corresponding acceptable control limits are presented in **Table 19**.

Table 19. Field Quality Assurance and Quality Control

Data Type	Comments and Acceptable Control Limits
Field personnel	Use appropriately trained field personnel employing procedures detailed in this assessment.
Field data collection	Site conditions and sample locations accurately surveyed and properly described. Information is to be recorded in field notes. Field notes are appropriately completed and included in the report on the assessment works. Test locations to be recorded on handheld GPS unit, accurate to 3m. Groundwater monitoring wells will be surveyed by a licensed surveyor.
Sample handling (storage and transport)	• Samples will be collected in appropriate sample containers, provided by the laboratory. The sampling containers will be labelled and stored in a sealed container immediately after sampling until receipt by the analysing laboratory • Sample numbers, dates, name of sampler, sample type, preservation and analytical requirements will be recorded on chain of custody (COC) documentation, which will also be delivered to the analytical laboratory • All samples are required to be documented as received by the laboratory intact
Field intra-laboratory duplicates/inter-laboratory duplicates	• Intra- and inter-laboratory duplicates will be collected and analysed at a rate of 1 in every 10 primary samples • Duplicate samples will be labelled so as to conceal their relationship to the primary sample from the laboratory. It is expected that relative percentage differences (RPD's) would be less than 30%, and if not, liaison with the laboratory will be undertaken and samples will be re-analysed, if required

6.9.2 Laboratory Quality Assurance and Quality Control

The laboratory quality aassurance procedures to be adopted and the internal laboratory quality control samples to be analysed and the corresponding acceptable control limits are presented in **Table 20**.

Table 20. Laboratory Quality Assurance and Quality Control

Data Type	Comments and Acceptable Control Limits
Sample Analysis	All sample analysis is to be conducted using the methods detailed by the nominated laboratory, which will implement a quality control plan in accordance with NEMP V2.0 (2020)
Holding Times	Maximum acceptable sample holding times as follows: • pH: 6 hours (field based pH readings will be used instead) • Phosphate, nitrite & nitrate: 2 days • Metal analysis (excluding mercury): 6 months • PFAS: 180 Days
Laboratory Detection Limits	All laboratory detection limits to be less than the assessment criteria.
Laboratory Blanks	• Laboratory blanks to be analysed at a rate of 1 in 10, with a minimum of one analysed per batch • Concentration of analytes to be less than the laboratory detection limits
Laboratory Duplicates	• Laboratory duplicates to be analysed at a rate of 1 in 10, with a minimum of one analysed per batch • RPDs to be less than 50% and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required
Laboratory Control Samples (LCS)	• LCSs to be analysed at a rate of 1 in 20 • Control limits: 70 to 130 % is considered as acceptable Recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required
Matrix Spikes	• Matrix spikes and matrix spike duplicates prepared by dividing a field sample into two aliquots, then spiking each with identical concentrations of the analytes at a rate of 1 in 20 • Matrix spike control limits: 70–130 % acceptable recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required • Matrix spike duplicates: RPDs <50% and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.

6.9.3 Data Quality Indicators

A summary of the data quality indicators (DQIs) and the corresponding measures to be applied for the investigation are presented in **Table 21**.

Table 21. Data Quality Indicators

DQI	Field Measures	Laboratory Measures	Acceptance limits
Precision	Sampling methodologies appropriate and complied with. Collection of duplicate and triplicate samples.	Analysis of: Field duplicate samples (1 in 20) Field triplicate samples (1 in 20) Laboratory duplicate samples	RPD of <50% RPD of <50% RPD of <50%
Accuracy	Sampling methodologies appropriate and complied with.	Analysis of: Method blanks [1] Matrix spikes [1] Matrix spike duplicates [1] Laboratory control samples [1] Laboratory prepared spikes [1] Reagent blanks [1] Reference materials [1]	Non-detect 70 – 130 % RPD of <50% 70 – 130% 70 – 130% Non-detect for CoC Varies
Sensitivity	Sampling methodologies appropriate and complied with	Sample laboratory detection limits. Appropriate laboratory detection limits.	< nominated criteria As set out in this SAQP
Representativeness	Appropriate media sampled according to SAQP. All media identified in SAQP sampled.	All samples analysed according to SAQP	All samples analysed according to SAQP
Comparability	Same sampling methodologies used on each day of sampling. Experienced sampler. Climatic conditions. Same types of samples collected.	Same analytical methods used (including clean-up) Sample laboratory detection limits (justify/quantify if different) Same laboratories and methods (NATA accredited) Same units	As per NEPC (2013) < nominated criteria
Completeness	All critical locations and media sampled. All samples collected and analysed. Sampling methodologies appropriate and complied with. Experienced sampler. Documentation correct. Data completeness.	All critical samples analysed and all analytes analysed according to SAQP Appropriate methods Appropriate laboratory detection limits Sample documentation complete Sample holding times complied with All critical samples analysed and all analytes analysed according to SAQP. Field and Laboratory methodology conducted in accordance with SAQP	As set out in this SAQP

Notes:

[1] These are completed as per internal laboratory methods for internal quality assurance and control procedures.

In the event that a DQI is not met by laboratory analyses, the field observations relating to the nature of the samples will be reviewed, and if no obvious source for the non-conformance is identified, such as an error in sampling, preservation of samples or heterogeneity of samples, liaison with the laboratory will be undertaken in an effort to identify the issue that has given rise to the non-conformance and additional analyses will be undertaken on the original samples, on duplicate samples or on other samples, if required.

If no explanation for the non-conformance is identified, the concentrations for the affected samples will be marked as estimates.

7 REFERENCES

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- Callide Power Station Receiving Environmental Monitoring Program (REMP) Manual, March 2019. Environmental Management Strategies, Revision R3, 29 March 2019
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- Epic (2022c) Callide Power Station – Contaminated Land Investigation Document (Site Investigation) 7 September 2022
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- Queensland Auditor Handbook for Contaminated Land (Department of Environment and Heritage Protection, Queensland Government), February 2019
- Queensland Australian River Assessment System (AusRivAS) sampling and processing manual 2001
- RDM Hydro (RDM Hydro 2022). Callide Power Station PFAS Investigations – Offsite Hydrogeological Conceptualisation, 8 March 2022. Final.
- US EPA (2006), Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA/G-4, (Ref. EPA/240/B-06/001)
- USEPA (2000), Data Quality Objectives, Process for Hazardous Waste Site Investigations, EPA QA/G-4HW, (Ref. EPA/600/R-00/007)

- Woodward-Clyde, Investigation of Environmental Impact of Ash Disposal Facilities, Callide Power Station. Project No. A3200679/0001, May 1997

8 ACRONYMS

- AFFF Aqueous Film-Forming Foams
- AHD Australian Height Datum
- AD4 Ash Dam 4
- COPC Contaminants of Potential Concern
- CSM Conceptual Site Model
- DES Department of Environmental Science
- DRD Drains Reclaim Dam
- DRNME Department of Natural Resources, Mines and Energy
- EA Environmental Authority
- ERA Environmentally Relevant Activities.
- ERT Emergency Response Team
- ESCP Eastern Seepage Collection Pond
- ESCT Eastern Seepage Collection Trench
- EtFOSA N-Ethyl perfluorooctane sulfonamide
- EtFOSAA N-Ethyl perfluorooctane sulfonamidoacetic acid
- EtFOSE N-Ethyl perfluorooctane sulfonamidoethanol
- EV Environmental Values
- FOSA Perfluorooctane sulfonamide
- FOT Fuel Oil Tanks (Callide B and C)
- FTG Fire Training Grounds (Callide B and C)
- FTS Fluorotelomer sulfonic acid
- GDE Groundwater Dependent Ecosystem
- HDPE High-density polyethylene
- LCS Laboratory control spikes
- LDPE Low-density polyethylene
- MeFOSA N-Methyl perfluorooctane sulfonamide
- MeFOSAA N-Methyl perfluorooctane sulfonamidoacetic acid
- MeFOSE N-Methyl perfluorooctane sulfonamidoethanol
- ML Megalitre
- MW Megawatt
- NEMP National Environmental Management Plan
- NSP Northern Stormwater Pond
- PFAS Per- and poly-fluoroalkyl substances
- PFBA Perfluorobutanoic acid
- PFBS Perfluorobutane sulfonic acid
- PFDA Perfluorodecanoic acid
- PFDS Perfluorodecane sulfonic acid
- PFHpA Perfluoroheptanoic acid
- PFHpS Perfluoroheptane sulfonic acid
- PFHxA Perfluorohexanoic acid
- PFHxS Perfluorohexane sulfonic acid
- PFNA Perfluorononanoic acid
- PFOA Perfluorooctanoic acid
- PFOS Perfluorooctane sulfonic acid
- PFPeA Perfluoropentanoic acid
- PFPeS Perfluoropentane sulfonic acid
- PFPoDA Perfluorododecanoic acid
- PFTeDA Perfluorotetradecanoic acid
- PFTrDA Perfluorotridecanoic acid
- PFUNDA Perfluoroundecanoic acid
- RO Reverse Osmosis
- RPD Relative percentage difference
- SAQP Sampling Analysis and Quality Plan
- TEP Transitional Environmental Program

- WCF Waste Containment Facility
- WSCP Western Seepage Collection Pond
- WSDC Western Seepage Diversion Channel

FIGURES

Figure F1. Site Location and Areas of Interest

Figure F2. AD4 Previous and Proposed Investigation Locations

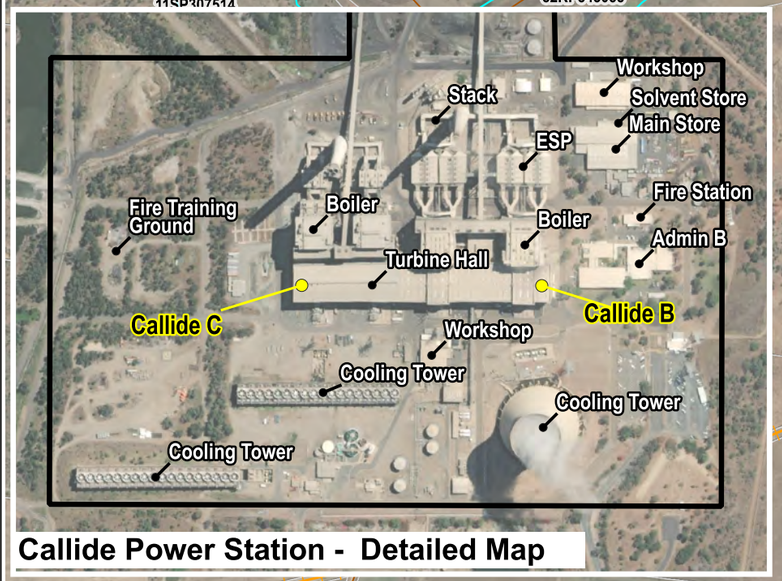
Figure F3. Callide A Previous and Proposed Investigation Locations

Figure F4. Proposed Quarterly Groundwater and Surface Water Sampling Locations

Figure F5. Proposed Seasonal Groundwater and Surface Water Sampling Locations

Figure F6. Proposed Annual Groundwater and Surface Water Sampling Locations

Figure F7. Proposed Event Based Surface Water Sampling Locations



Callide Power Station - Detailed Map

DRAFT

Data Source:
© The State of Queensland (Department of Resources) 2021
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Legend

- Callide power station - site boundary
- Area of interest
- Cadastre (DCDB)
- Ash Dam B catchment area
- Spillway
- Watercourses
- Roads and tracks
- Railways

0 200 400 600 800 1,000 m

Scale: 1: 18,000@ A3

Datum: GDA94 Projection: MGA zone 56

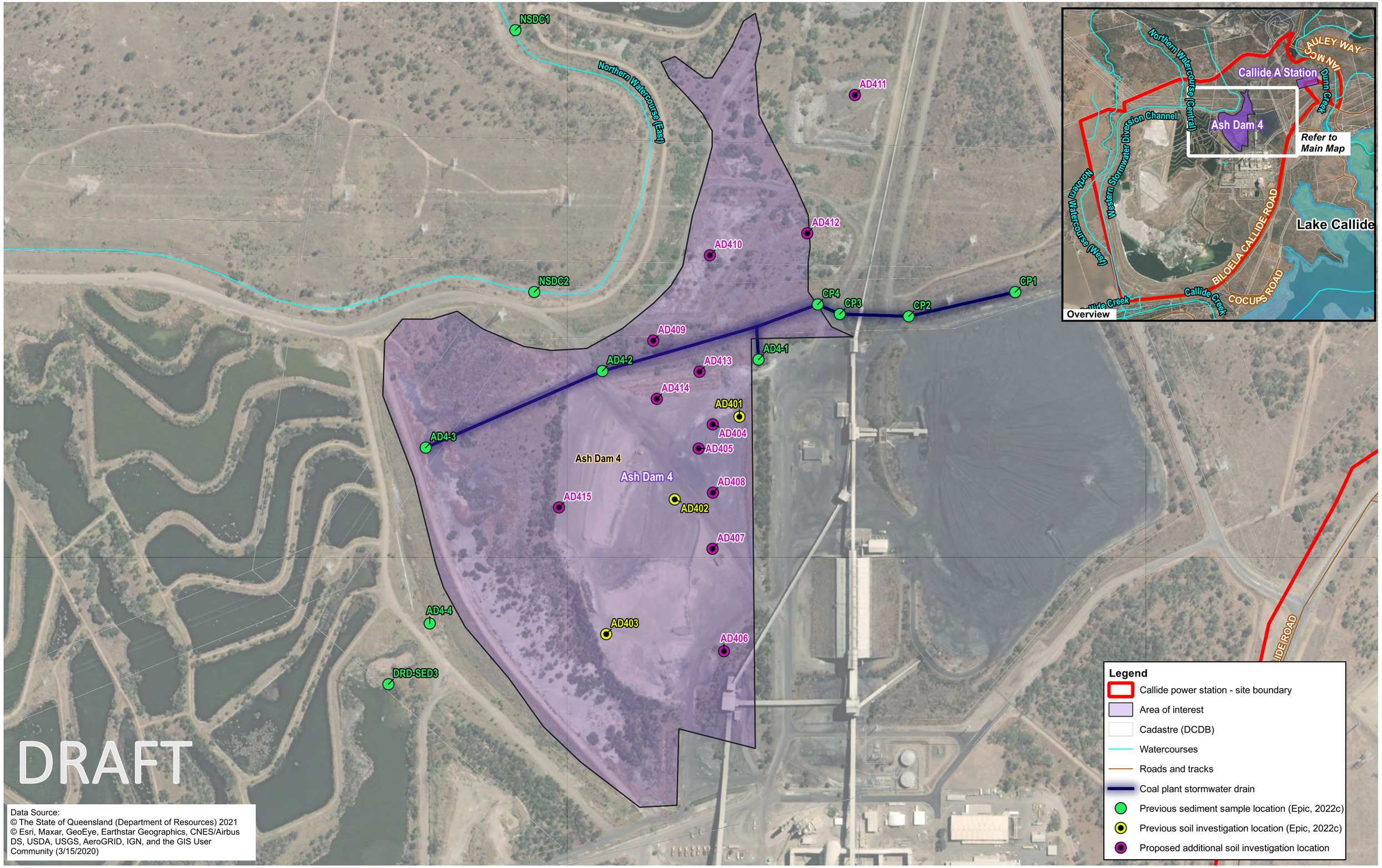
epic ENVIRONMENTAL

CS Energy
PFAS investigation (Callide Power Station)
Addendum Sampling and Analysis Quality Plan

Figure F1
Site Features and Layout

BC200153.03 Rev A 04/02/2023

©QGIS 2019 File Path: E:\GIS\Projects\2020\BC2020\BC200153.01 CS Energy CallideWorkspaces\BC200153.03\Addendum Sampling and Analysis Quality Plan\Figure F1 Site Location and Areas of Interest.qgz



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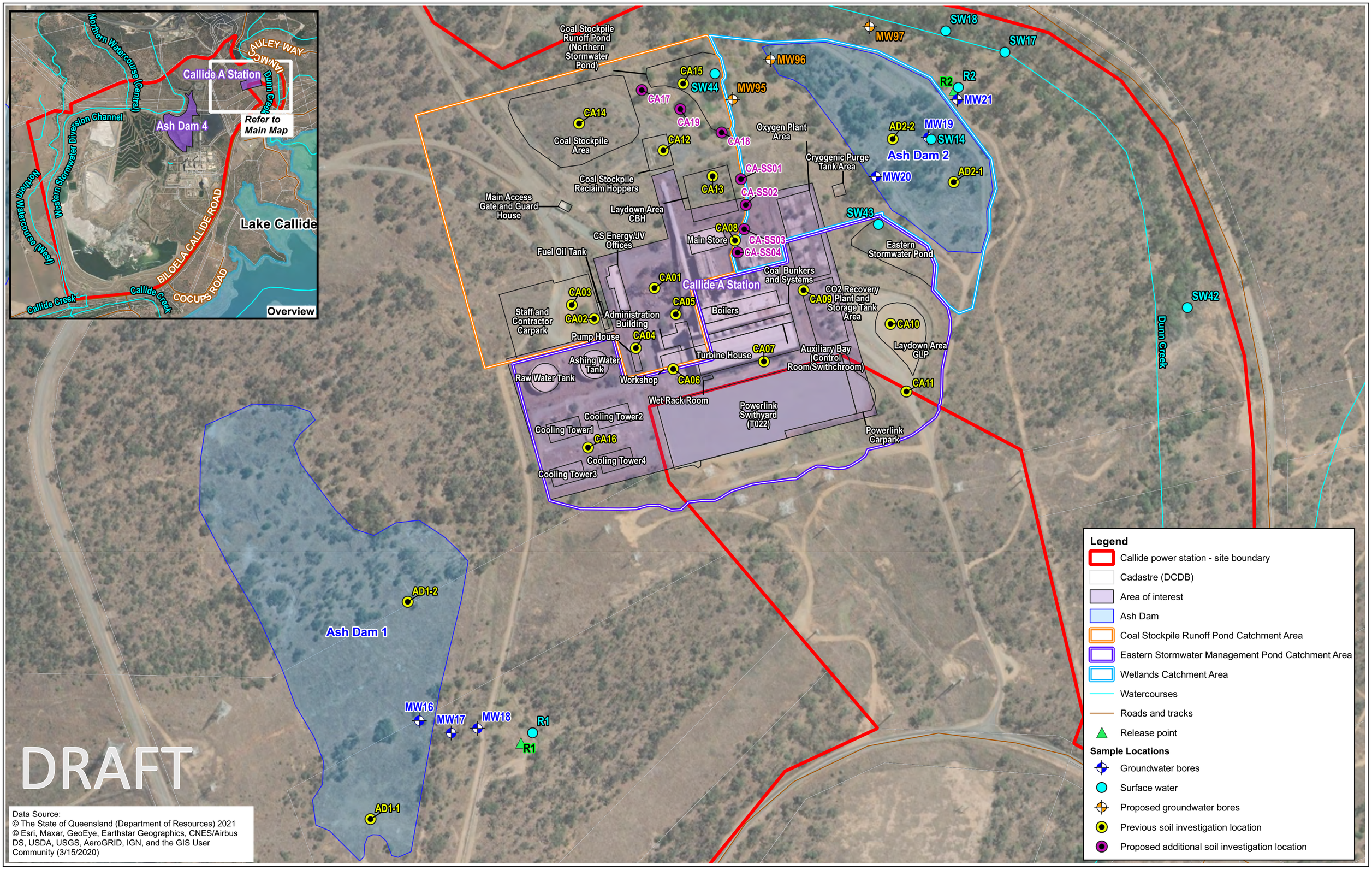
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CS Energy
PFAS investigation (Callide Power Station)
Addendum Sampling and Analysis Quality Plan

Figure F2
AD4 Previous and Proposed Investigation Locations



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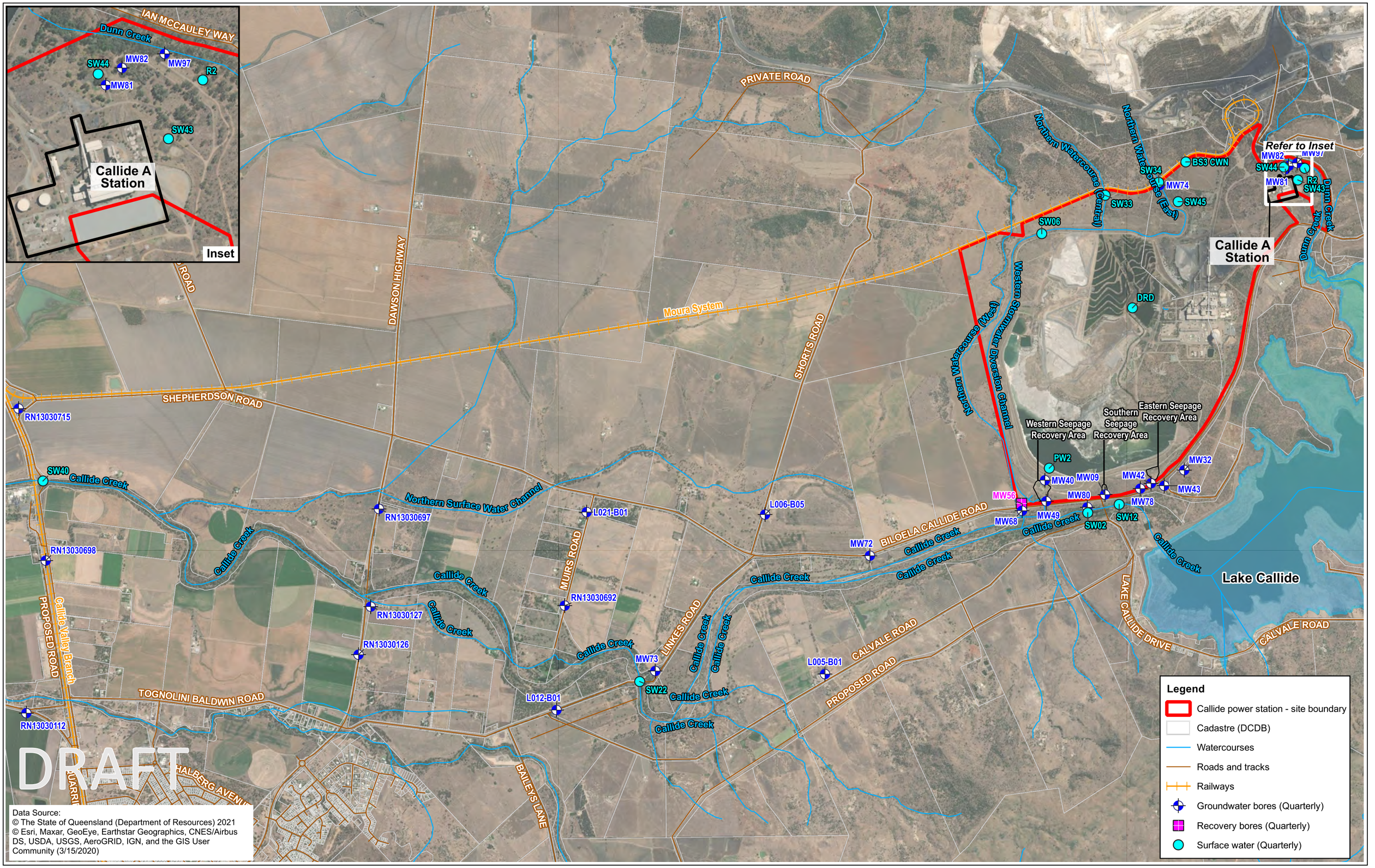
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Datum: GDA94 Projection: MGA zone 56

CS Energy
PFAS investigation (Callide Power Station)
Addendum Sampling and Analysis Quality Plan

Figure F3
Callide A Previous and Proposed Investigation Locations



©QGIS 2019 File Path: E:\GIS\Projects\2020\BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.03\Addendum Sampling and Analysis Quality Plan\Figure F4-7 Proposed Quarterly Groundwater and Surface Water Sampling Locations.qgz

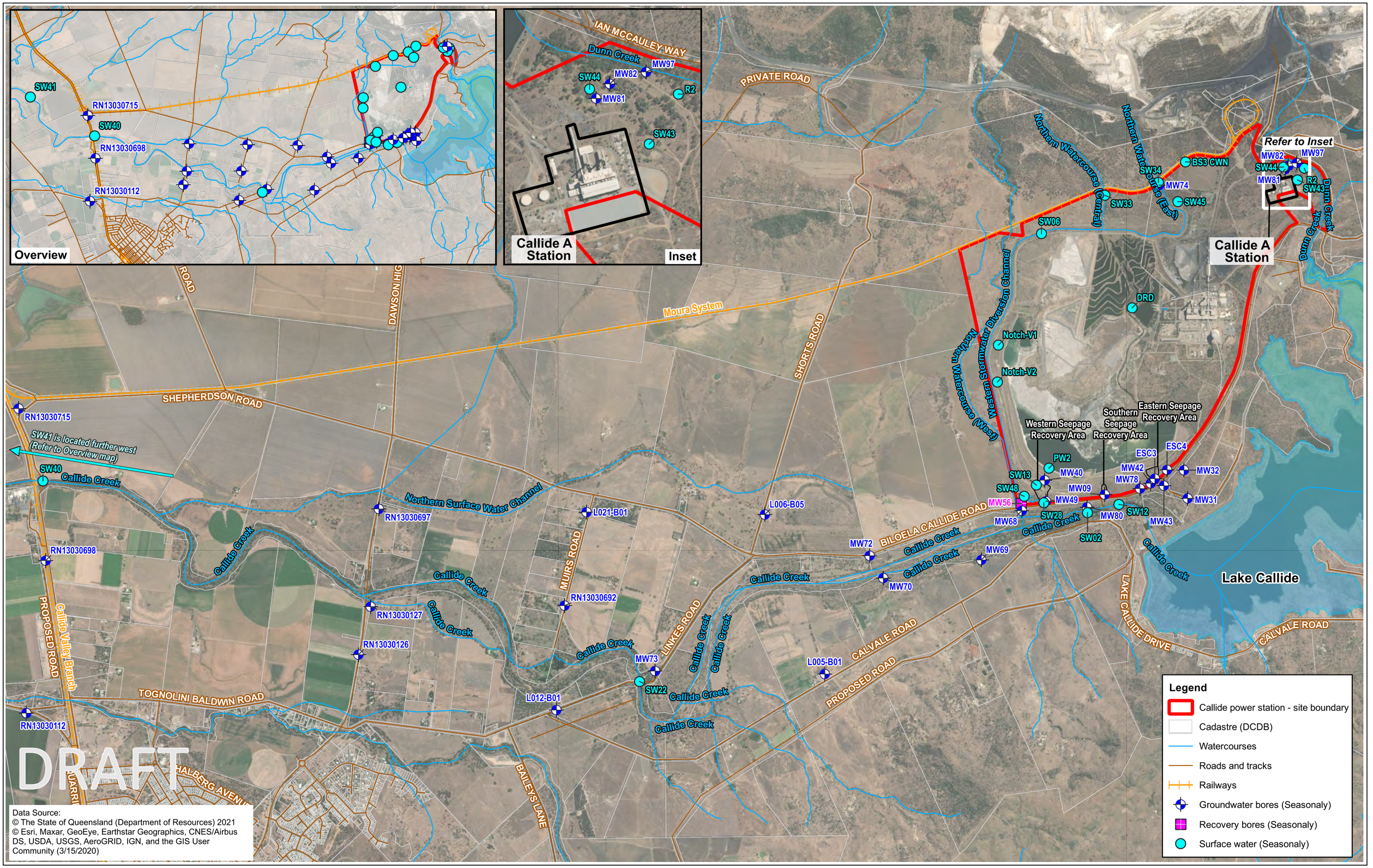
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Scale: 1: 35,000@ A3

Datum: GDA94 Projection: MGA zone 56

CS Energy
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Figure F4
Proposed Quarterly Groundwater and Surface Water Sampling Locations



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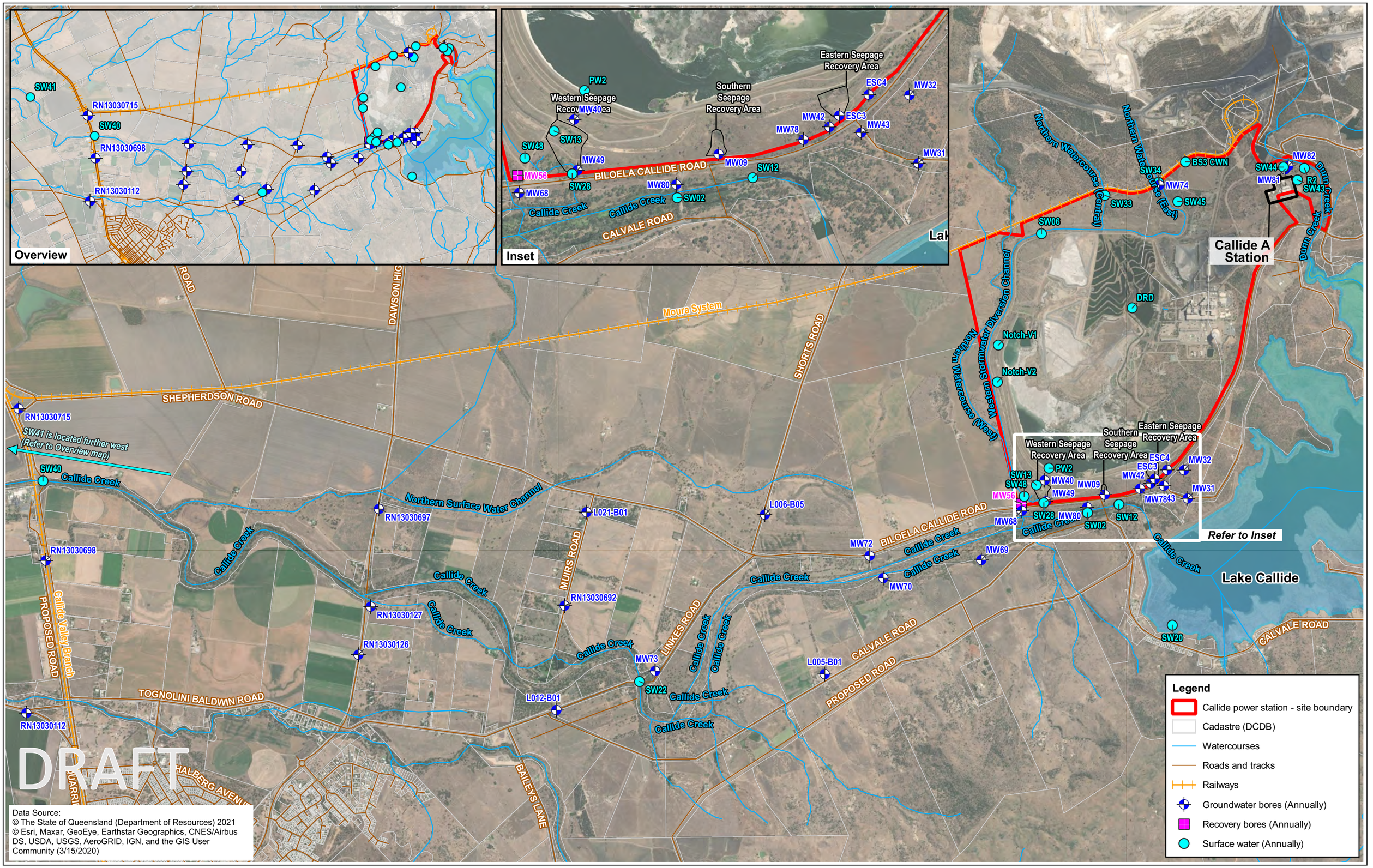
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PFAS investigation (Callide Power Station)
Addendum Sampling and Analysis Quality Plan

Figure F5
Proposed Seasonal Groundwater and Surface Water Sampling Locations

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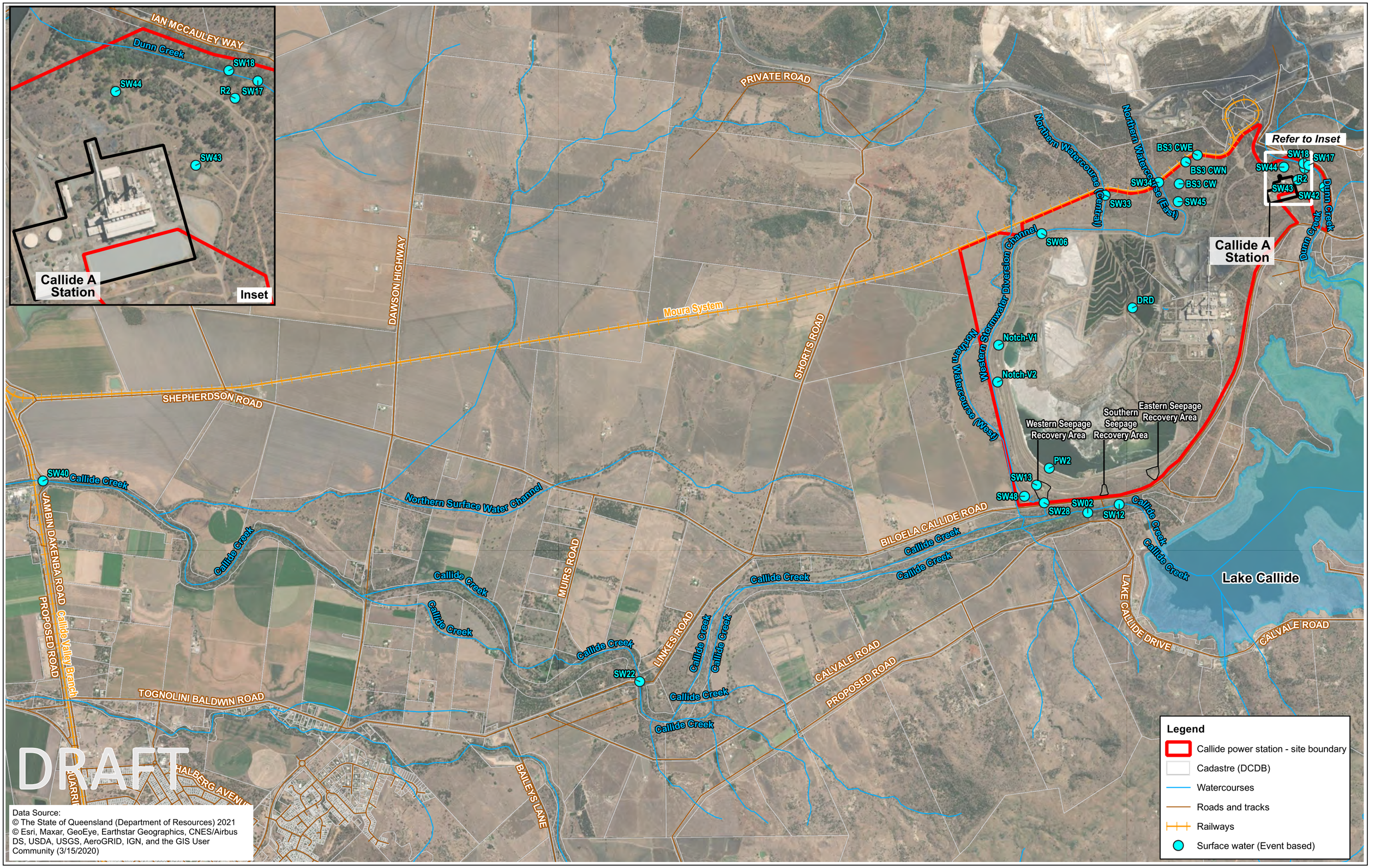
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Datum: GDA94 Projection: MGA zone 56

CS Energy
PFAS investigation (Callide Power Station)
Addendum Sampling and Analysis Quality Plan

Figure F6
Proposed Annual Groundwater and Surface Water Sampling Locations



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0 500 1,000 1,500 2,000 m

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Datum: GDA94 Projection: MGA zone 56

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Addendum Sampling and Analysis Quality Plan

Figure F7
Proposed Event Based Surface Water Sampling Locations

TABLES

A summary of the proposed sampling events is provided in the tables below.

Table T1. Quarterly Sampling Locations

Area of Interest	Groundwater	Surface Water
Northern Site Boundary	MW74	SW06 SW33 SW34 SW45 BS3-CWN
Callide A	3 New Wells (See **Section 6.3**)	R2 SW43 SW44
Eastern Seepage	MW32 MW42 MW43	-
Western Seepage	MW40 MW49 MW56 MW68	-
Southern Seepage	MW09 MW78	-
Callide Creek	MW72 MW73 MW80	SW02 SW12 SW22 SW40
Callide Alluvium	L005-B01 L006-B05 L012-B01 L021-B01 RN13030698 RN13030127 RN13030697 RN13030692 RN13030126 RN13030112 RN13030715	-
Western Stormwater Drainage Channel and onsite	-	DRD PW2

Table T2. Seasonal (Wet/Dry) Sampling Locations

Area of Interest	Groundwater	Surface Water
Northern Site Boundary	MW74	SW06 SW33 SW34 SW45 BS3-CWN
Callide A	3 New Wells (See **Section 6.3**)	R2 SW43 SW44
Eastern Seepage	MW31 MW32 MW33 MW42 MW43 ESC3 ESC4	-
Western Seepage	MW40 MW49 MW56 MW68	SW13
Southern Seepage	MW09 MW78	-
Callide Creek	MW69 MW70 MW72 MW73 MW80	SW02 SW12 SW22 SW40 SW41
Callide Alluvium	L005-B01 L006-B05 L012-B01 L021-B01 RN13030698 RN13030127 RN13030697 RN13030692 RN13030126 RN13030112 RN13030715	-
Callide Dam	-	SW20
Western Stormwater Drainage Channel and onsite	-	SW48 SW28 DRD PW2 Location immediately west of notch-v1

Table T3. Annual Sampling Locations

Area of Interest	Groundwater	Surface Water
Northern Site Boundary	MW74	SW06 SW33 SW34 SW45 BS3-CWN
Callide A	3 New Wells (See **Section 6.3**)	R2 SW43 SW44
Eastern Seepage	MW31 MW32 MW33 MW42 MW43 ESC3 ESC4	-
Southern Seepage	MW09 MW78	-
Western Seepage	MW40 MW49 MW56 MW68	SW13
Callide Creek	MW69 MW70 MW72 MW73 MW80	SW02 SW12 SW22 SW40 SW41
Callide Alluvium	L005-B01 L006-B05 L012-B01 L021-B01 RN13030698 RN13030127 RN13030697 RN13030692 RN13030126 RN13030112 RN13030715	-
Callide Dam	-	SW20
Western Stormwater Drainage Channel and onsite	-	SW28 SW48 DRD PW2 Location immediately west of notch-v1

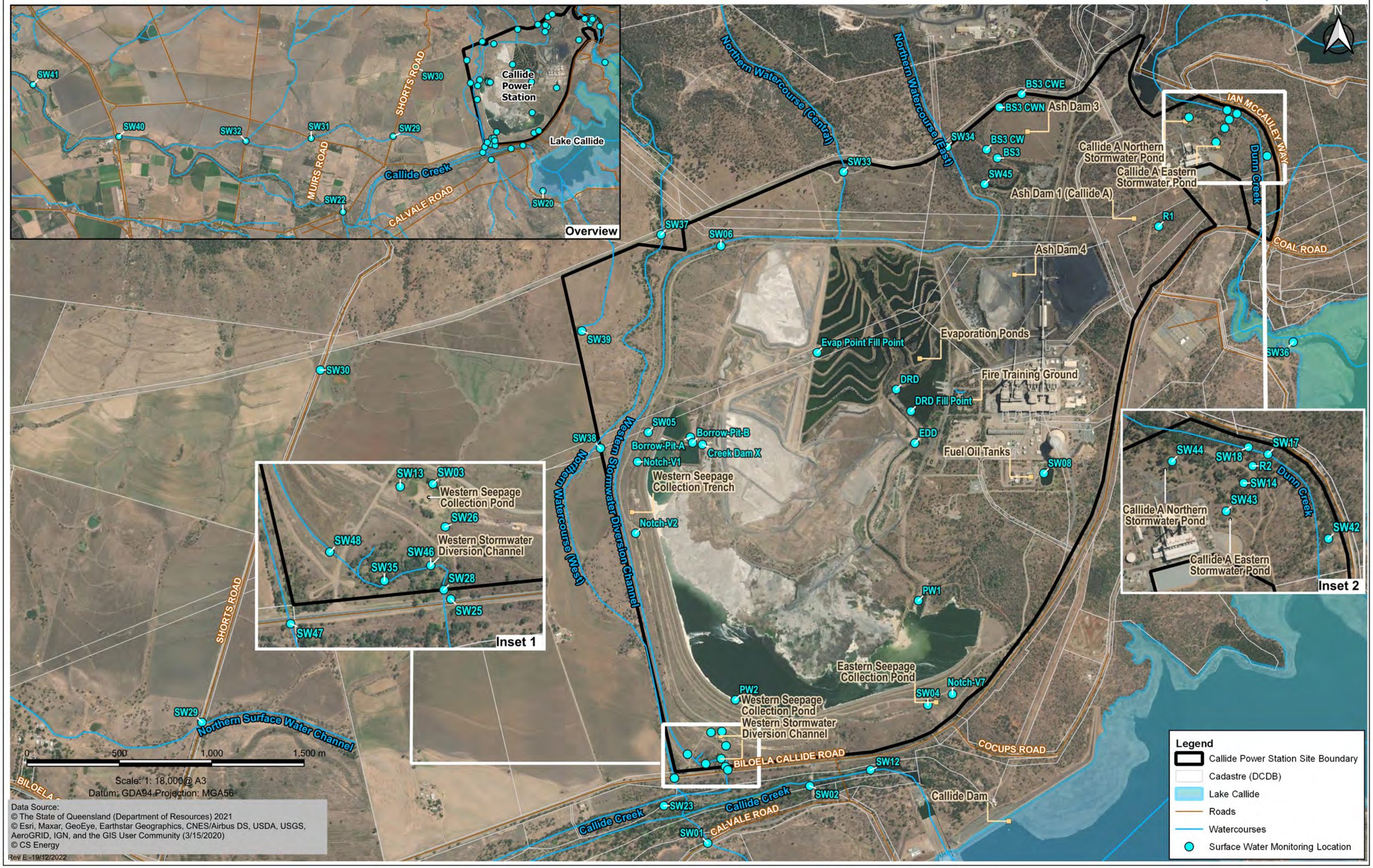
Table T4. Event Based Sampling Locations (Rainfall >20mm)

Area of Interest	Sample Locations
Northern Boundary	SW06 SW33 SW34 SW45 BS3-CWE BS3-CWN BS3-CW
Western Stormwater Drainage Channel	SW28 SW48 Location immediately west of notch-v1
Callide A / Dunn Creek	R2 SW17 SW18 SW43 SW44 SW42
Western Seepage Area	SW13
Callide Creek	SW02 SW12 SW22 SW40

APPENDIX A CURRENT CS ENERGY SAMPLING LOCATIONS

CS Energy
PFAS investigation (Callide Power Station)

Figure F1
Surface Water Monitoring Locations

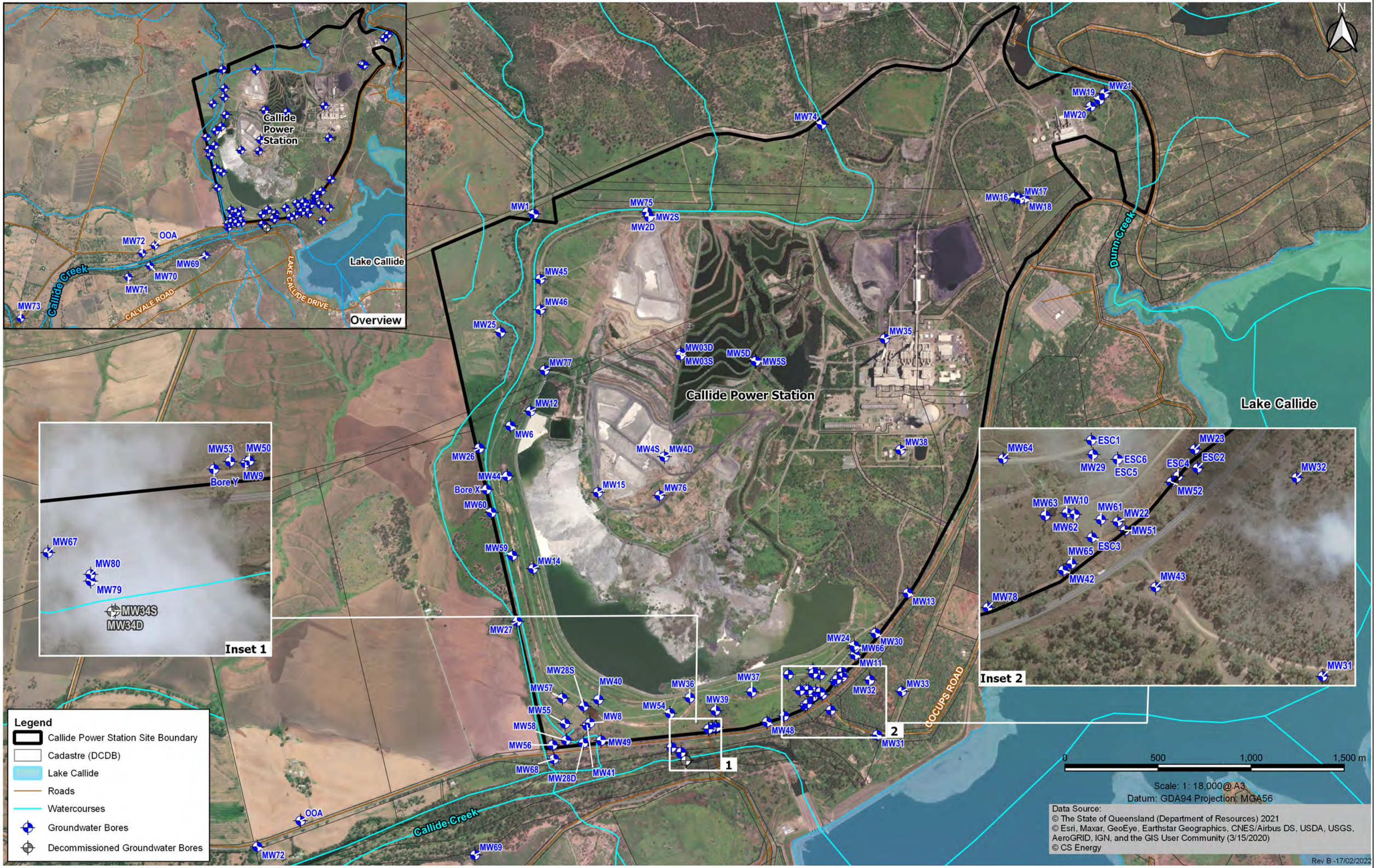


Data Source:
© The State of Queensland (Department of Resources) 2021
© Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (3/15/2020)
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PFAS investigation (Callide Power Station)

Figure F2
Groundwater Monitoring Locations



APPENDIX B CS ENERGY NORTHERN BOUNDARY SENSORS

Northern Boundary Sensors

Background

CS Energy wanted to implement a way of monitoring water at the northern boundary of the site. The objective was to estimate the volume of water that was entering the site via conventional waterways or other.

It was decided that LDDS75 sensors would be installed at appropriate locations to gather the data required.

Technology

The LDDS75 is a LoRaWAN Distance Detection Sensor for Internet of Things solution. It is used to measure the distance between the sensor and a flat object. The distance detection sensor is a module that uses ultrasonic sensing technology for distance measurement, and temperature compensation is performed internally to improve the reliability of data.

The LDDS75 can be applied to scenarios such as horizontal distance measurement, liquid level measurement, parking management system, object proximity and presence detection, intelligent trash can management system, robot obstacle avoidance, automatic control, sewer, bottom water level monitoring, etc.

It detects the distance between the measured object and the sensor and uploads the value via wireless to LoRaWAN IoT Server.

The LoRa wireless technology used in LDDS75 allows device to send data and reach extremely long ranges at low data-rates. It provides ultra-long range spread spectrum communication and high interference immunity whilst minimizing current consumption.

LDDS75 is powered by 4000mA or 8500 mA Li-SOCI2 battery; It is designed for long term use up to 10 years*.

Each LDDS75 pre-loads with a set of unique keys for LoRaWAN registrations, register these keys to local LoRaWAN server and it will auto connect if there is network coverage, after power on.

Locations

The sensors were strategically placed at surface water monitoring sites SW33 and SW34 as there are culverts present at those locations. That allows us to measure volumes of water entering the site given we will have data from both the sensor as well as the dimensions of the culvert piping.

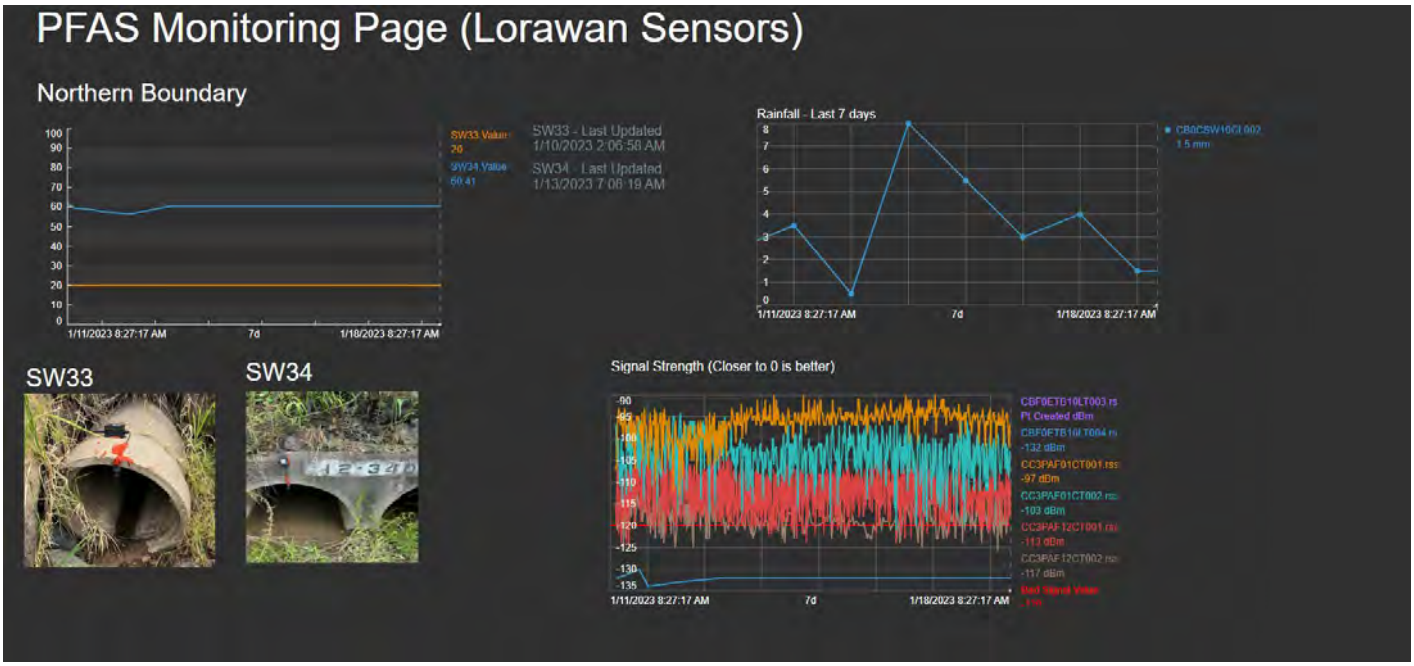
The locations are detailed in the following table.

Site name	SW33
Coordinates	S 24° 20’04.49” E 150° 36’49.47”
Photos	
Diameter of culvert	61cm

Site name	SW34
Coordinates	S 24° 21’52.40” E 150° 35’58.18”
Photos	
Diameter of culvert	111cm

Data Collection

Data is currently collected at 20-minute intervals. This can be altered to feed data more often however this would decrease the battery life expectancy of the unit. The data is presented in the following format. It includes the depth of water (mm) by time. Rainfall over the same period is presented next to it as well as the signal strength and photos of sensor locations.



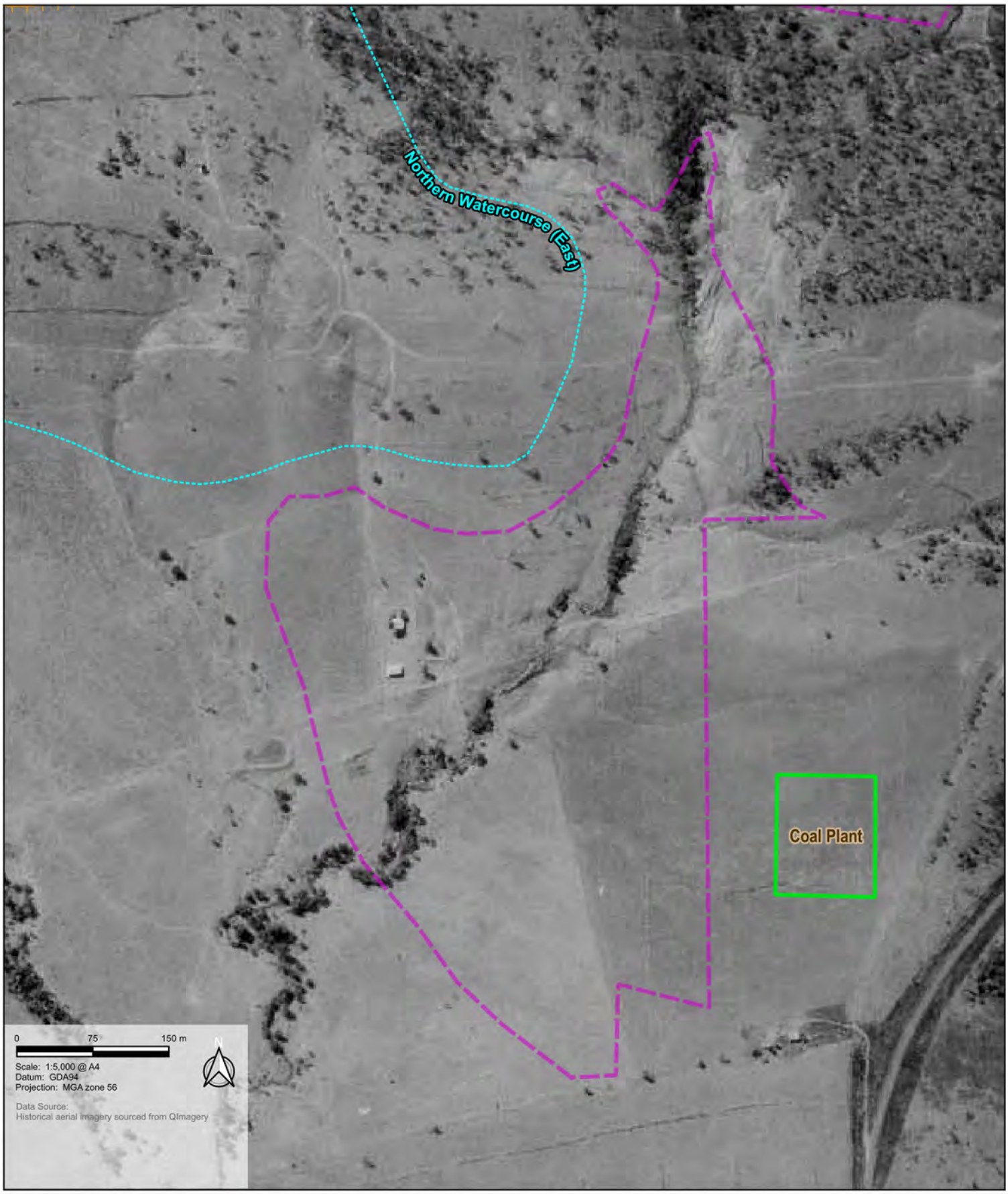
The link to access the data is:
https://titanvis.csenergy.com.au/PIVision/#/Displays/3892/PFAS-Monitoring

Limitations & Calibration

The signal strength is currently not at its best due to the distance it must travel to send data back to CS. We are in the process of installing a new gateway in a more central location will increase the signal strength and thus the confidence of the data.

On a fortnightly basis, or whenever it rains, a member of the environment team will be going out to collect a field measurement of water depth where the probe is placed. This will allow us to verify the readings the sensor is feeding us.

APPENDIX C AERIAL PHOTOGRAPHS



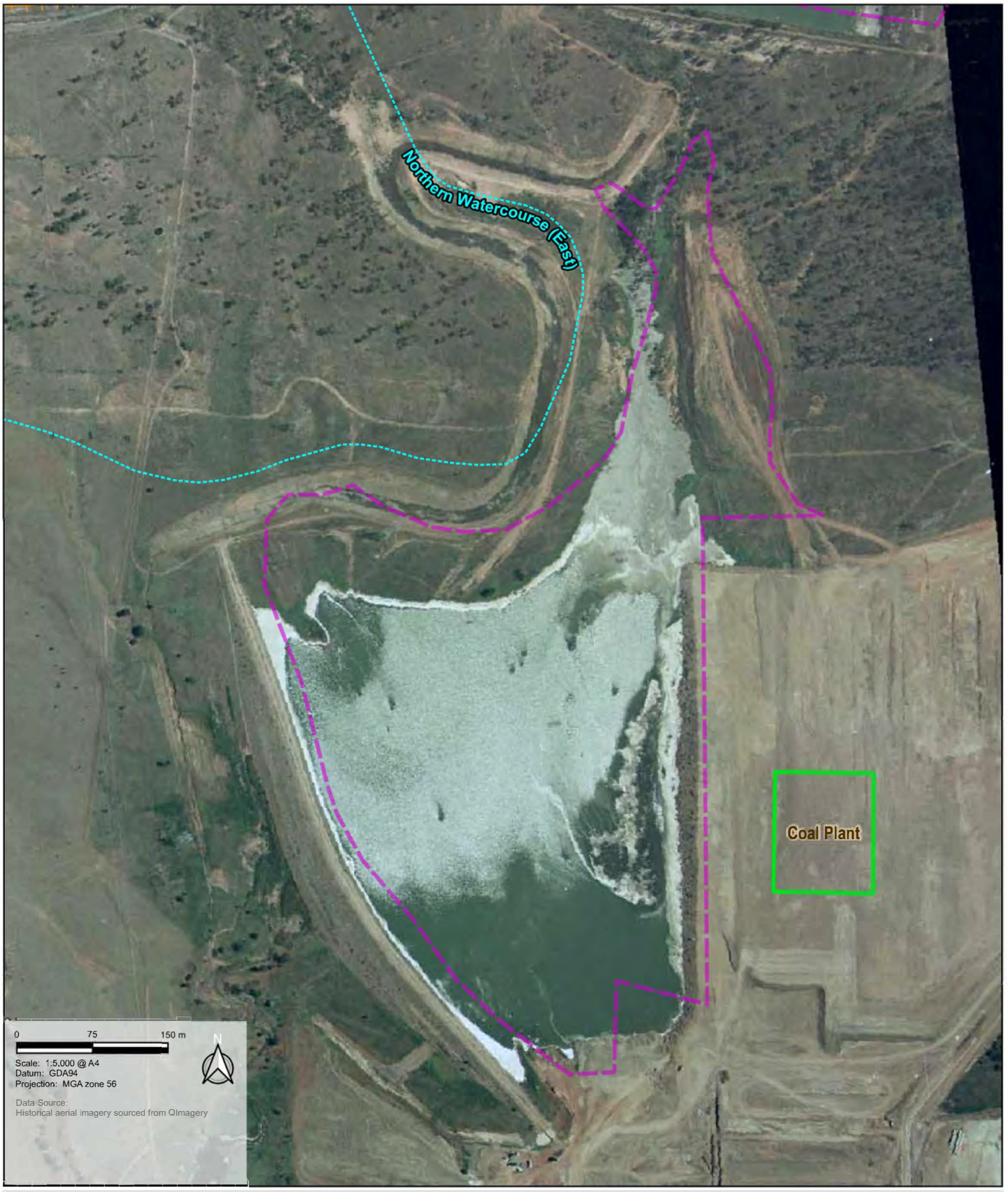
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - 1977



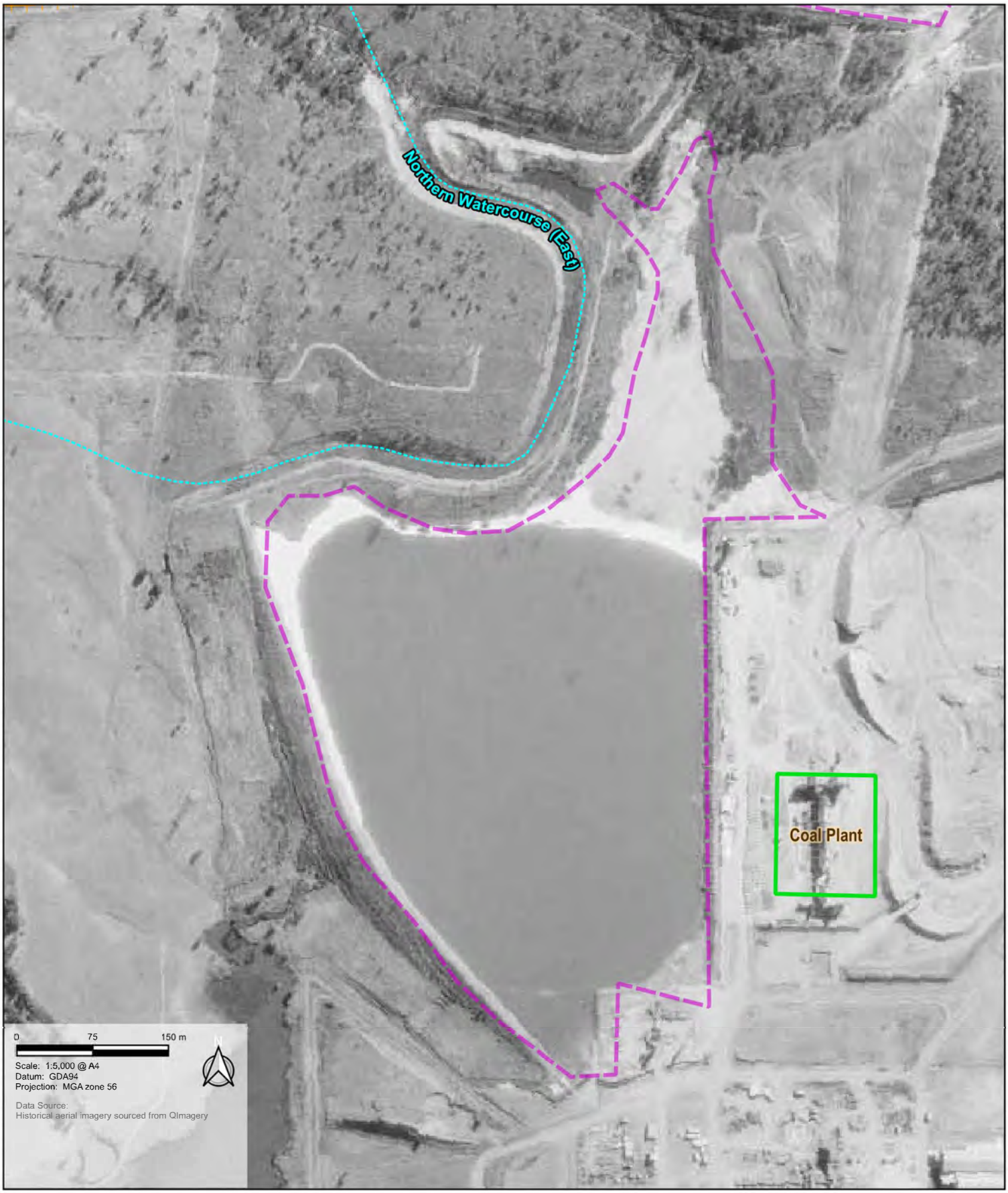
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
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Addendum SAQP

Appendix C
- Historical Imagery - 1981



Filepath: ~BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.03\Addendum Sampling and Analysis Quality Plan\Appendix - Historical Aerial.qgz

Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
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Addendum SAQP

Appendix C
- Historical Imagery - 1984



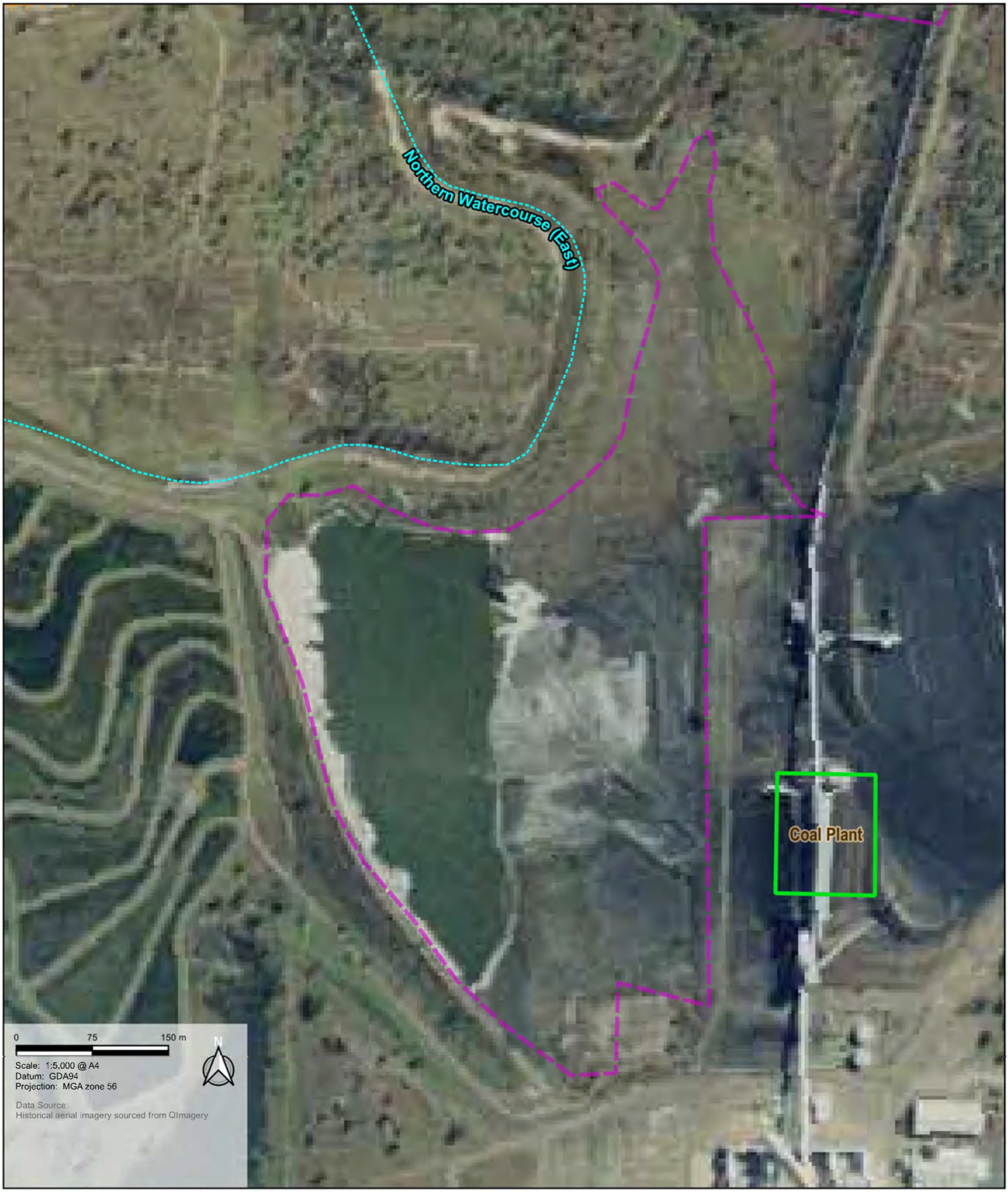
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - 1988



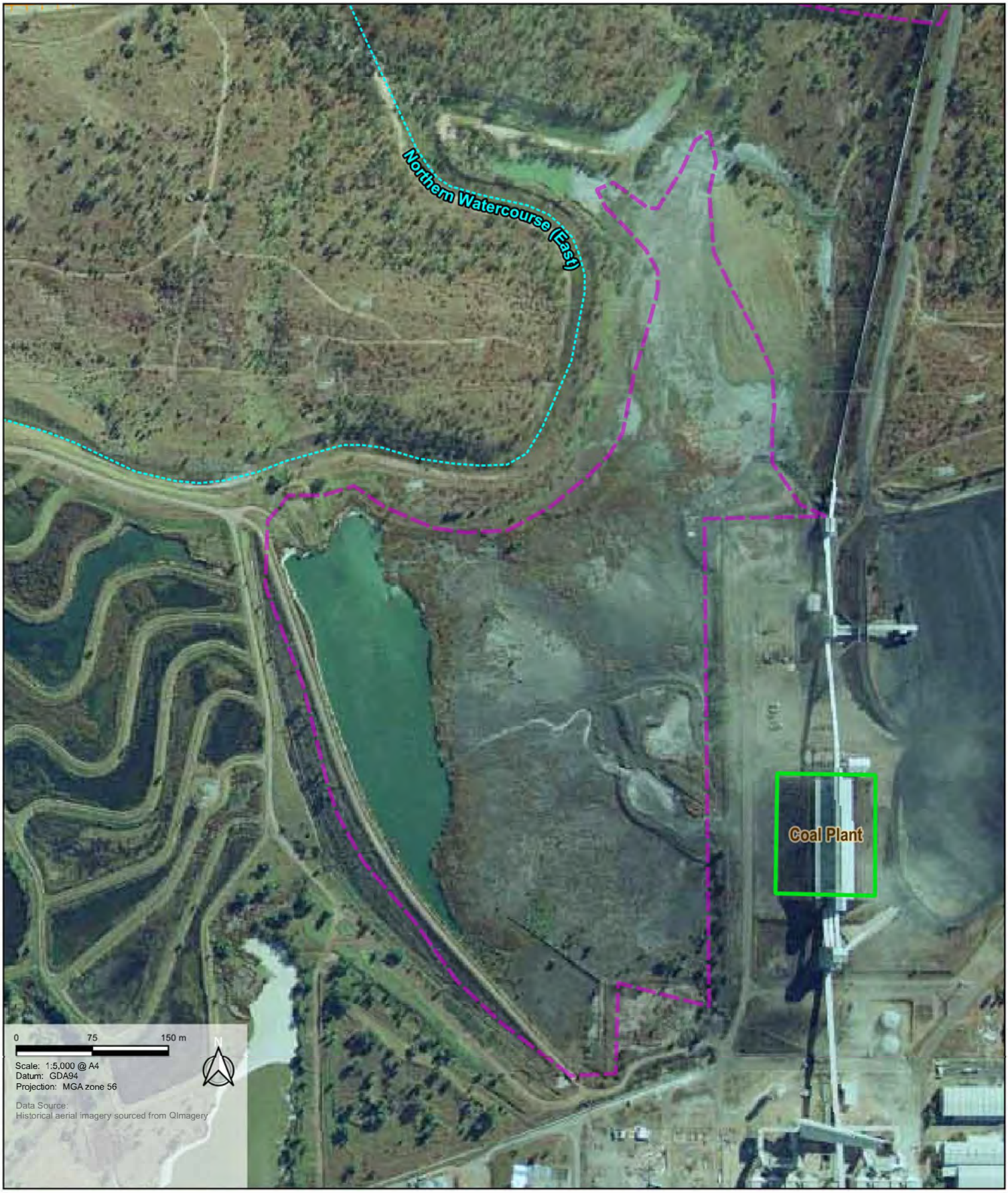
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
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Addendum SAQP

Appendix C
- Historical Imagery - 1994



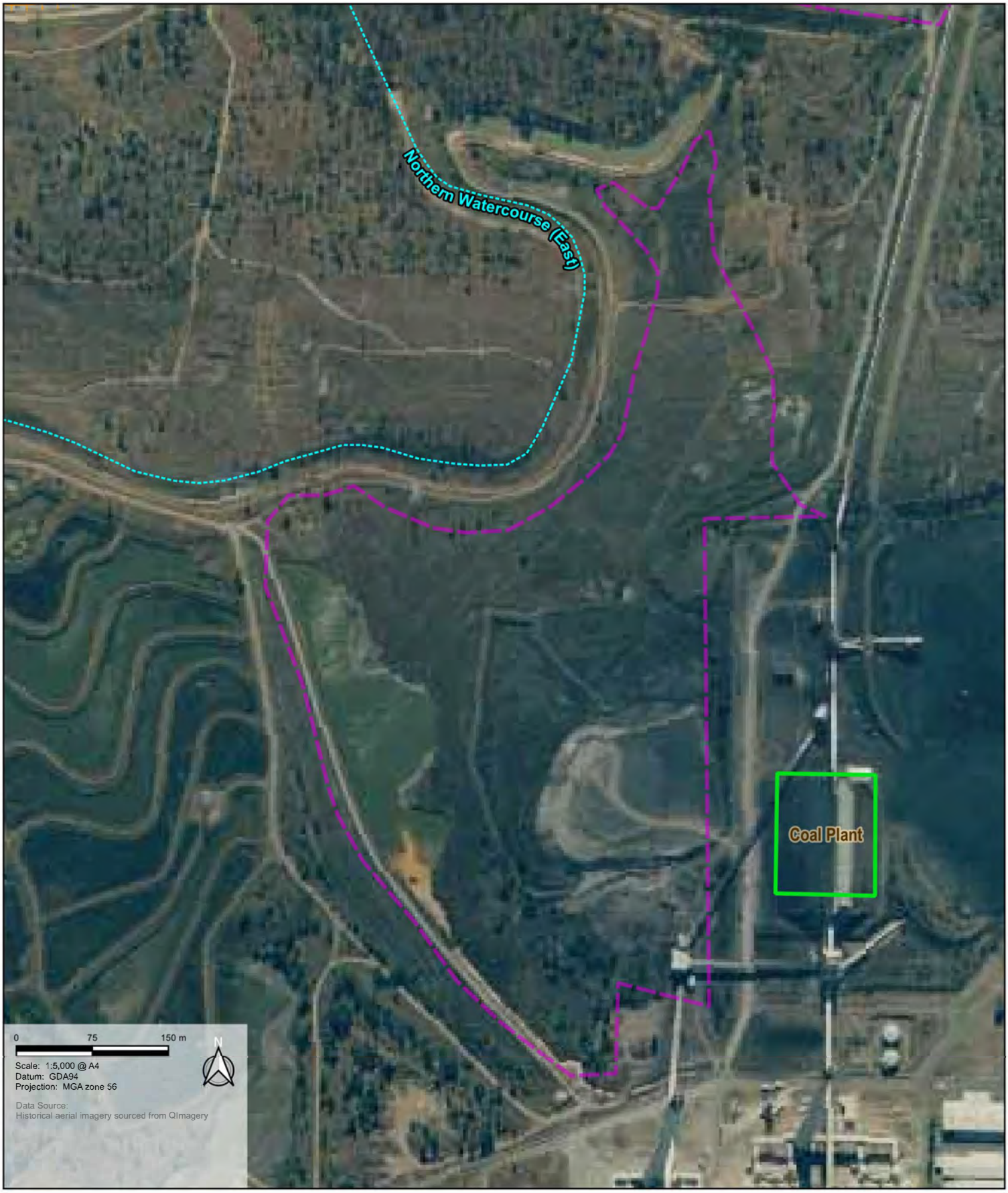
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - 1999



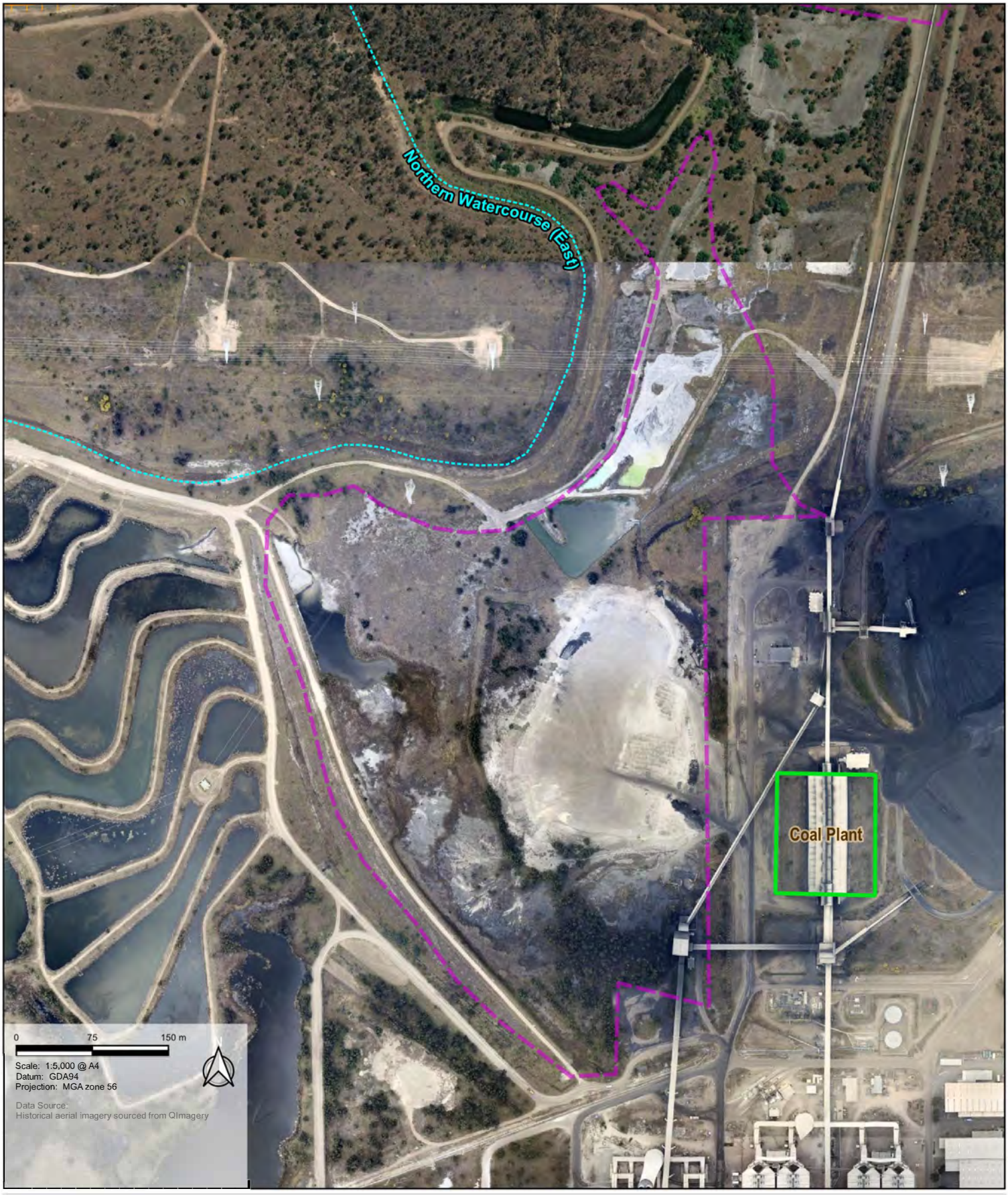
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - 2004



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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - 2012



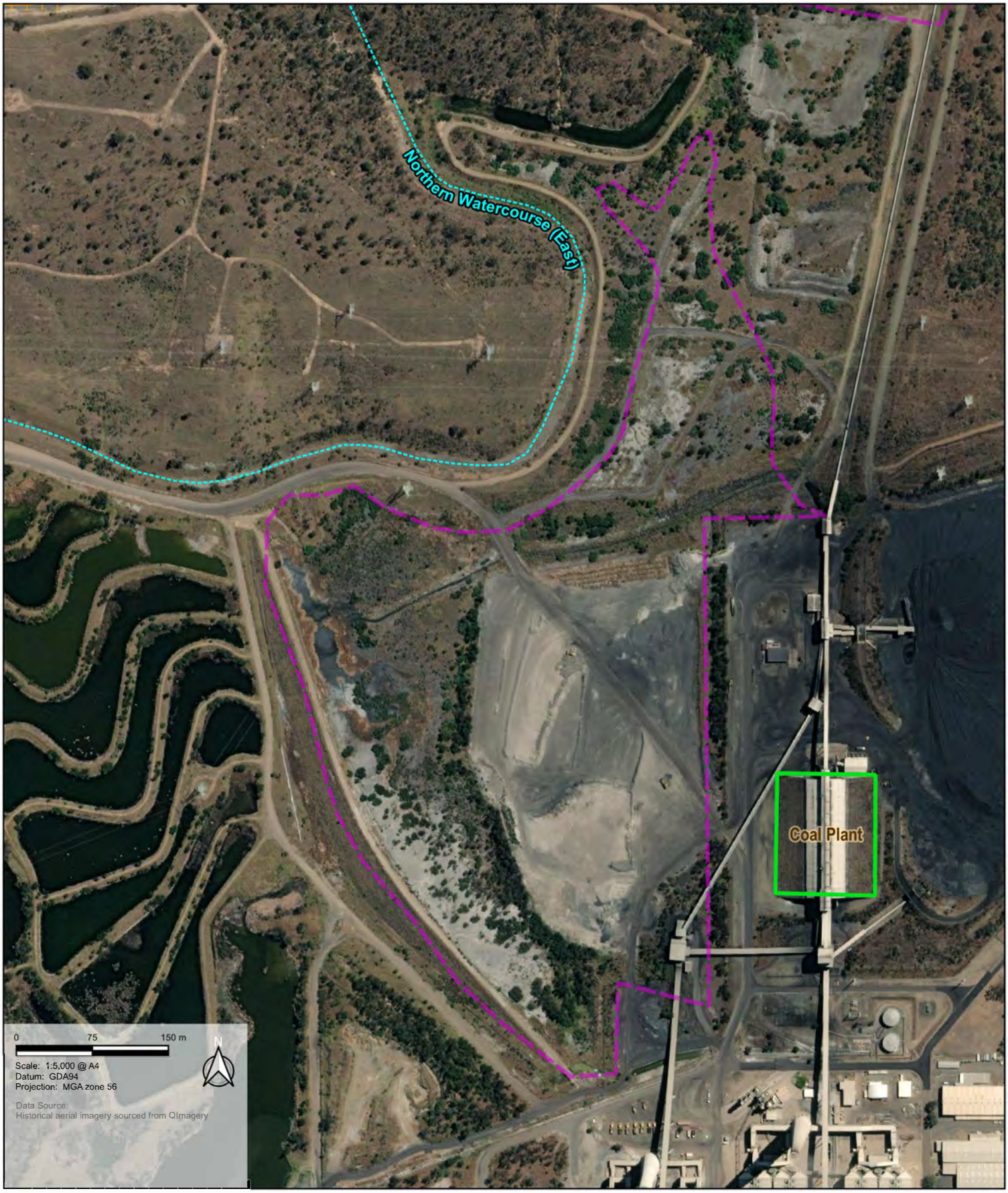
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Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
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Addendum SAQP

Appendix C
- Historical Imagery - 2017



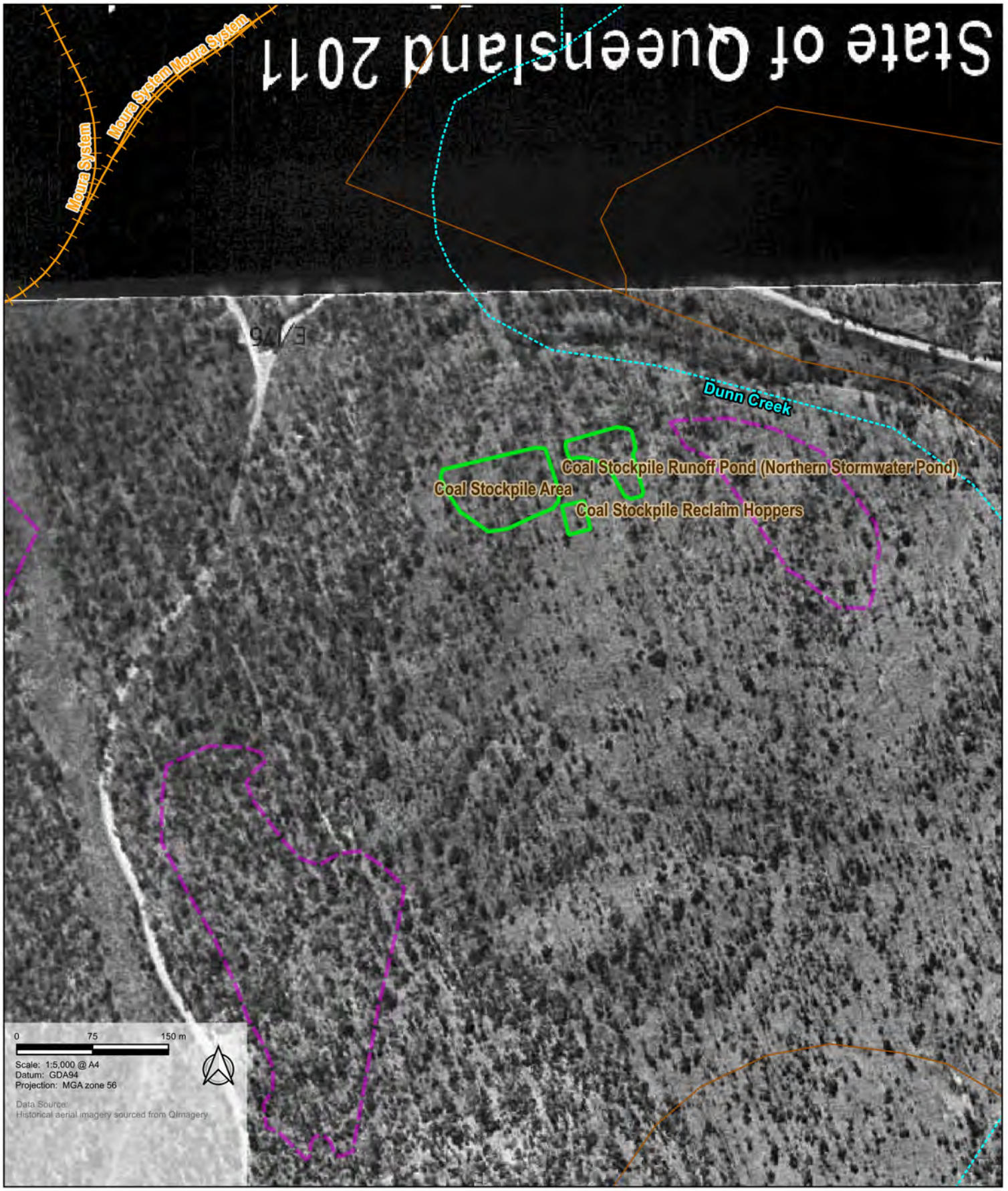
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - 2021



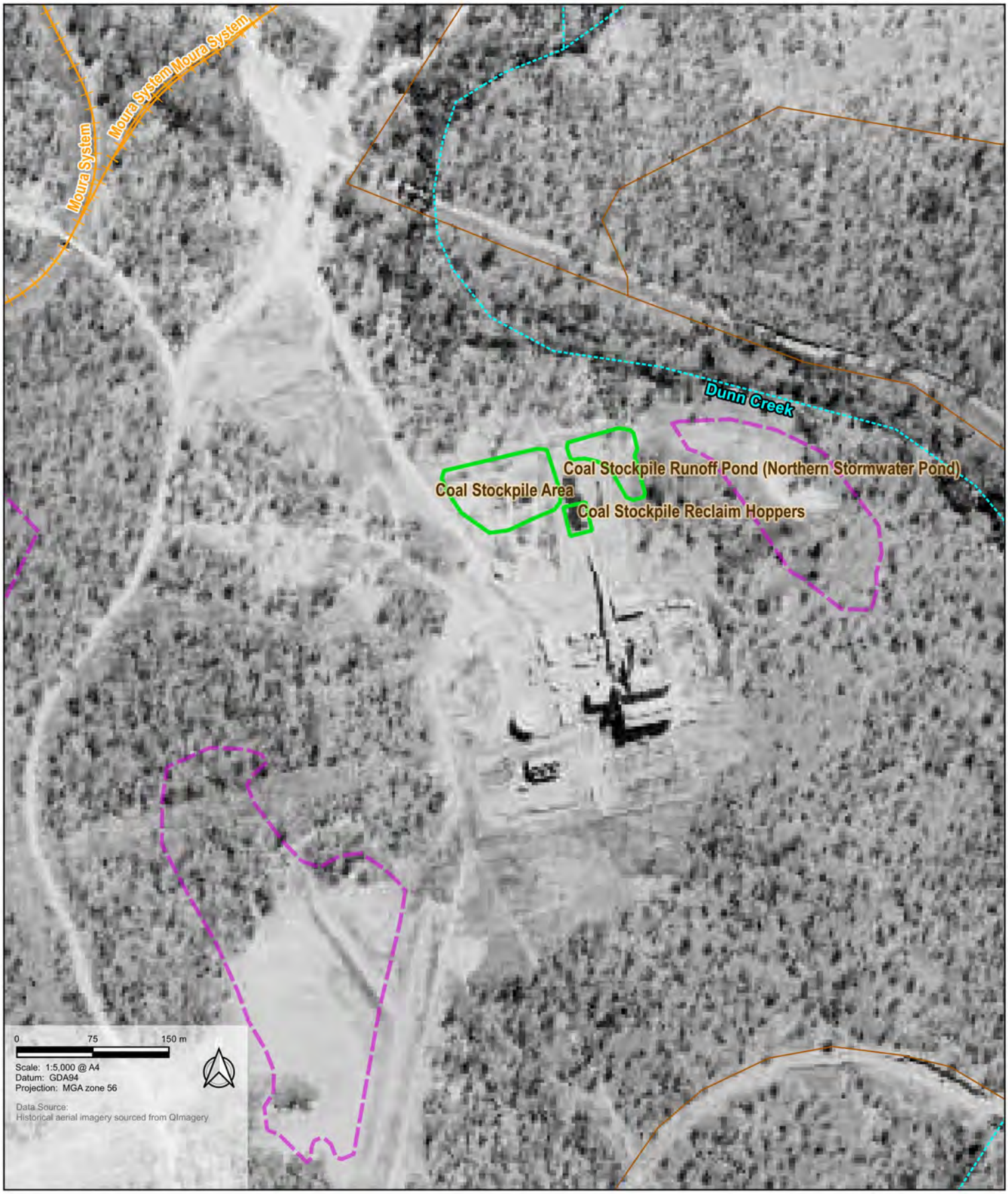
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 1958



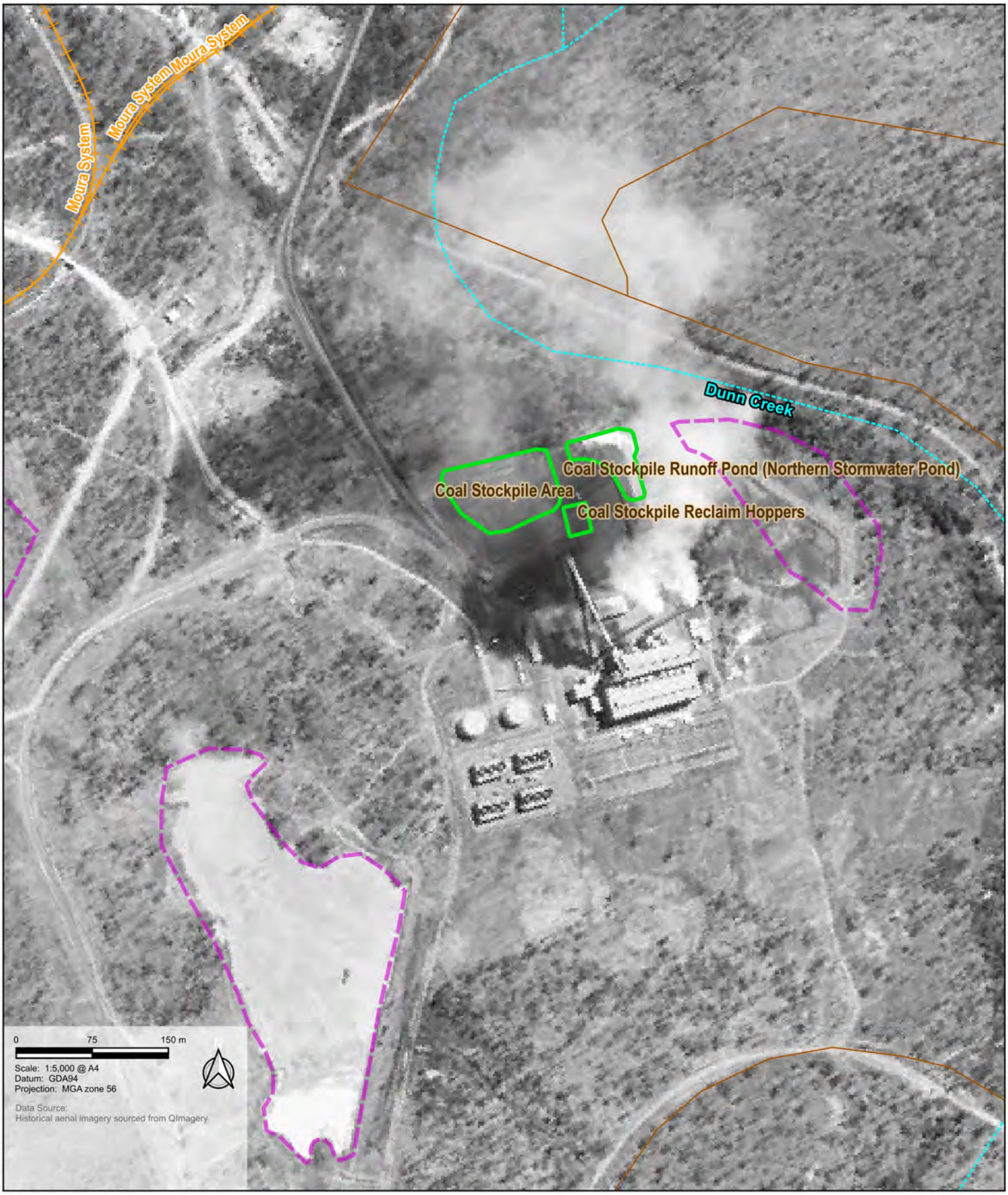
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 1965



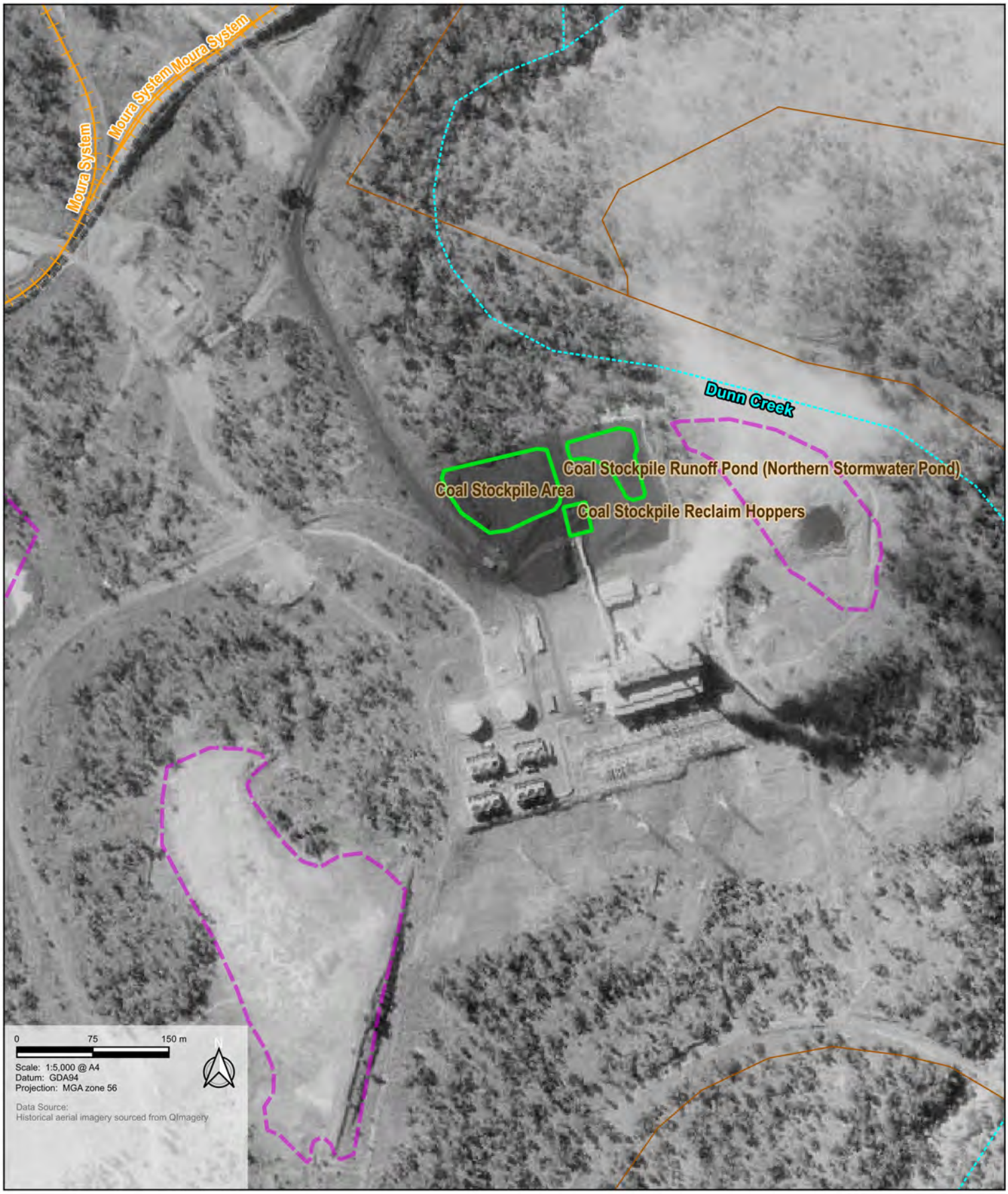
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
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Addendum SAQP

Appendix C
- Historical Imagery - Callide A 1973



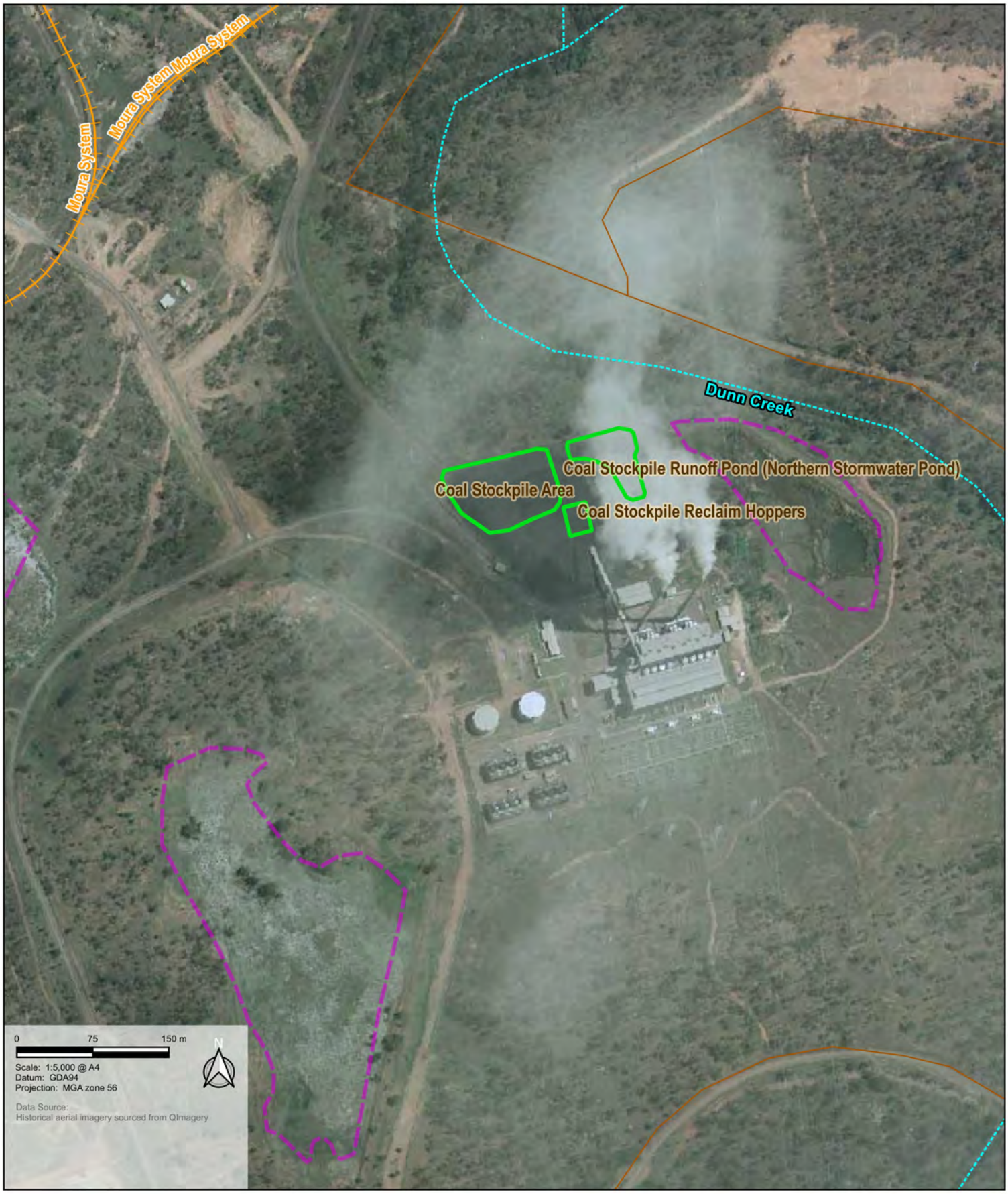
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 1973



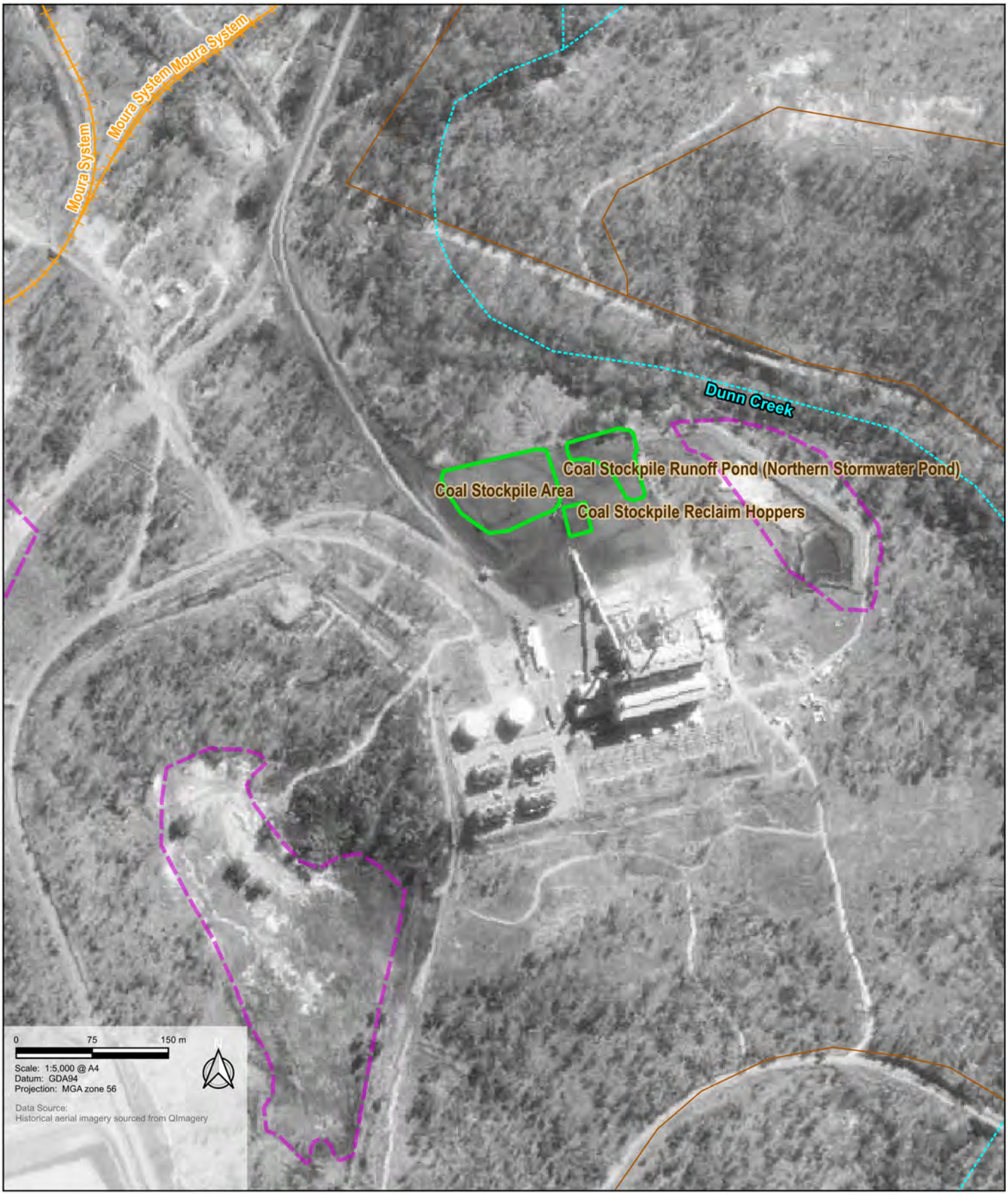
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 1981



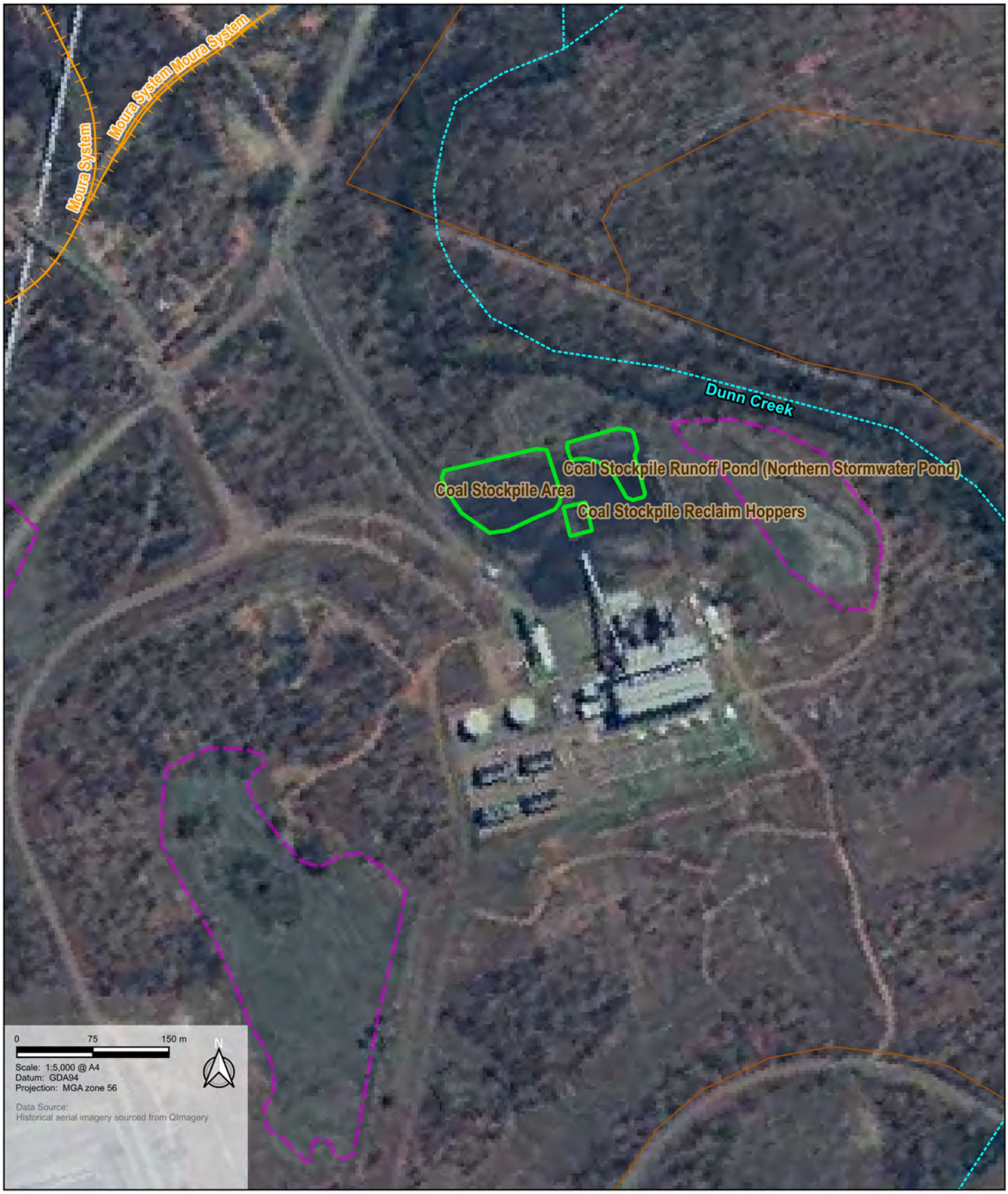
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

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Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 1984



Filepath: ~BC2020\BC200153.01 CS Energy Callide\Workspaces\BC200153.03\Addendum Sampling and Analysis Quality Plan\Appendix - Historical Aerial.qgz

Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 1988



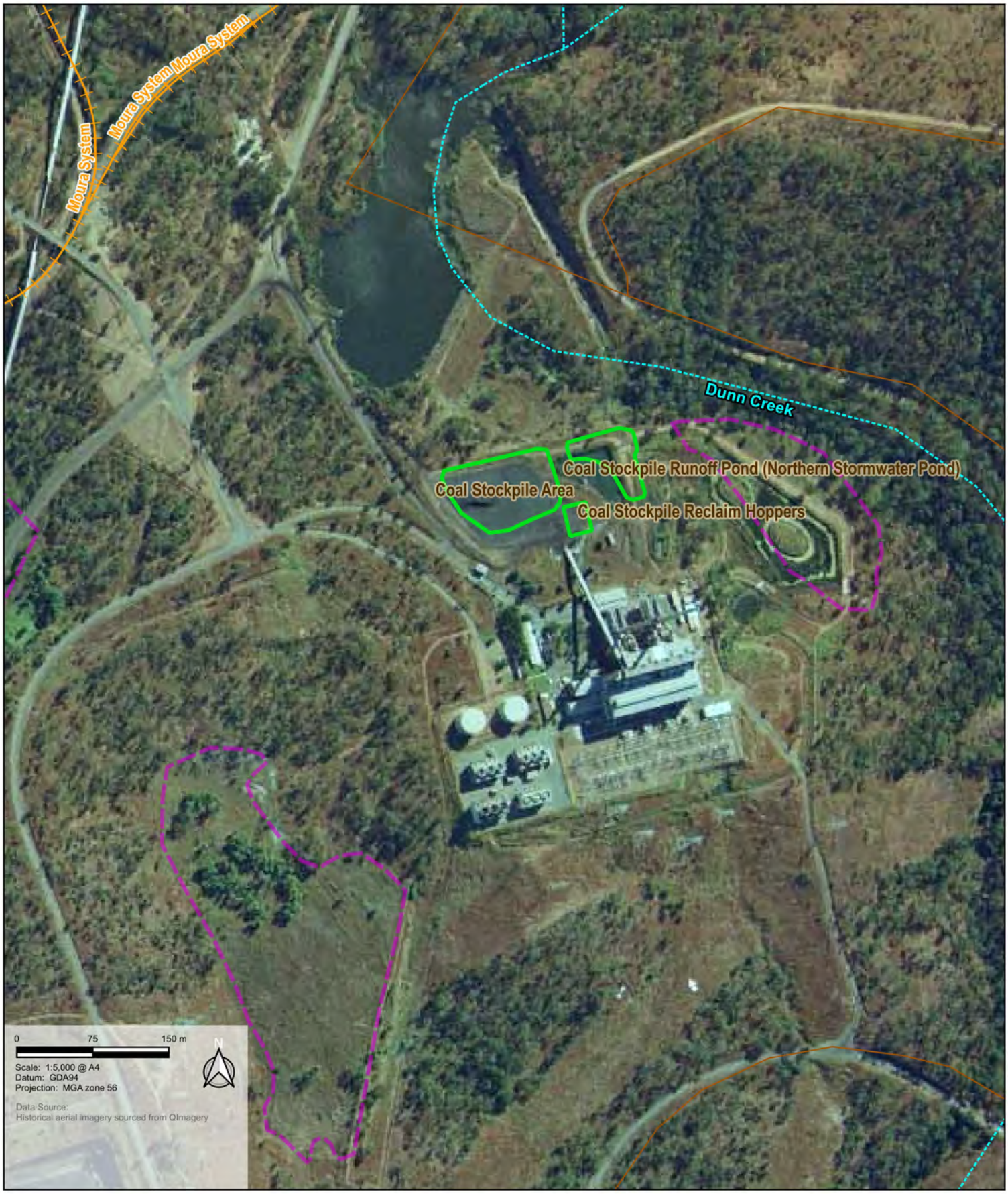
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 1994



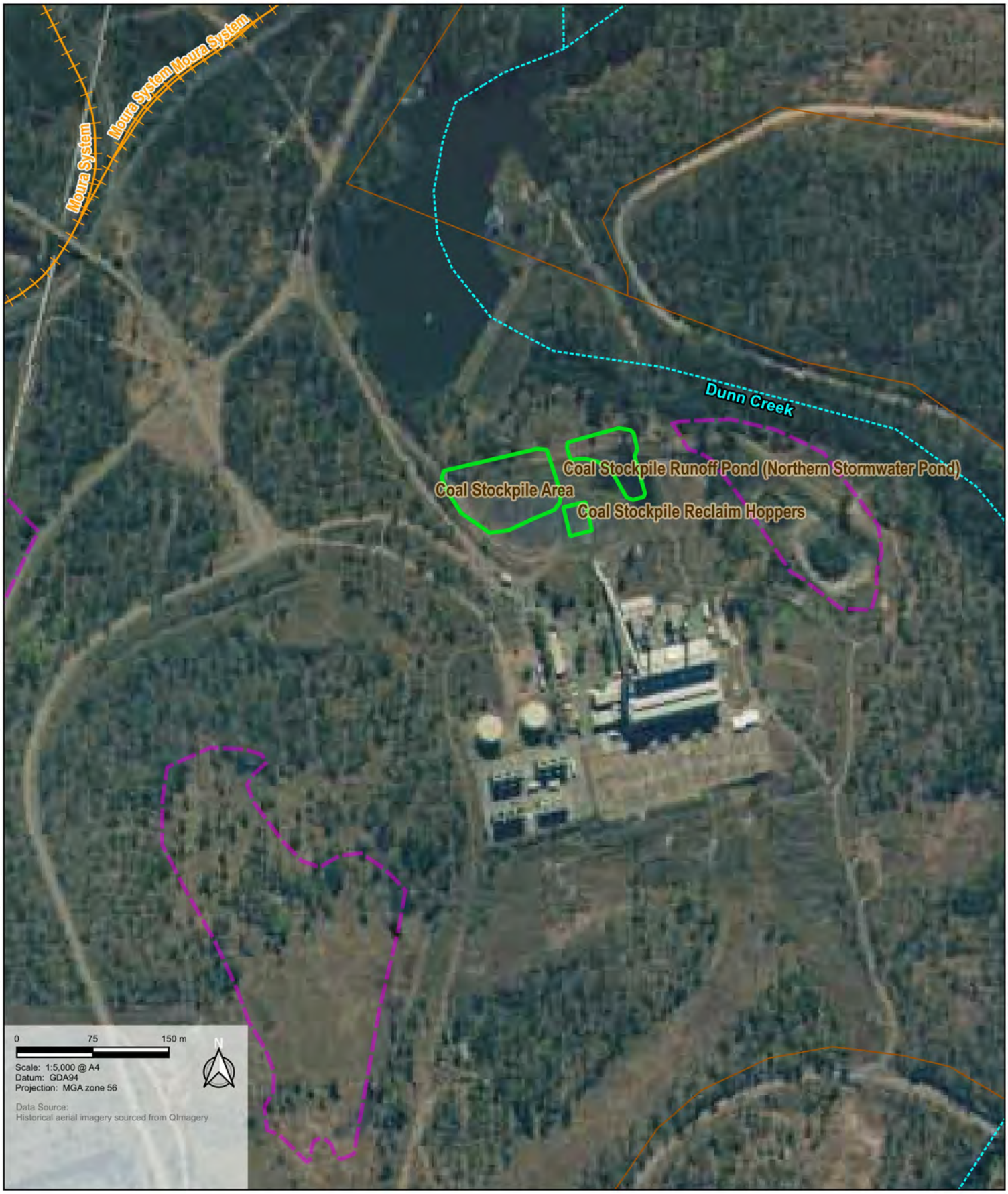
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 1999



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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 2004



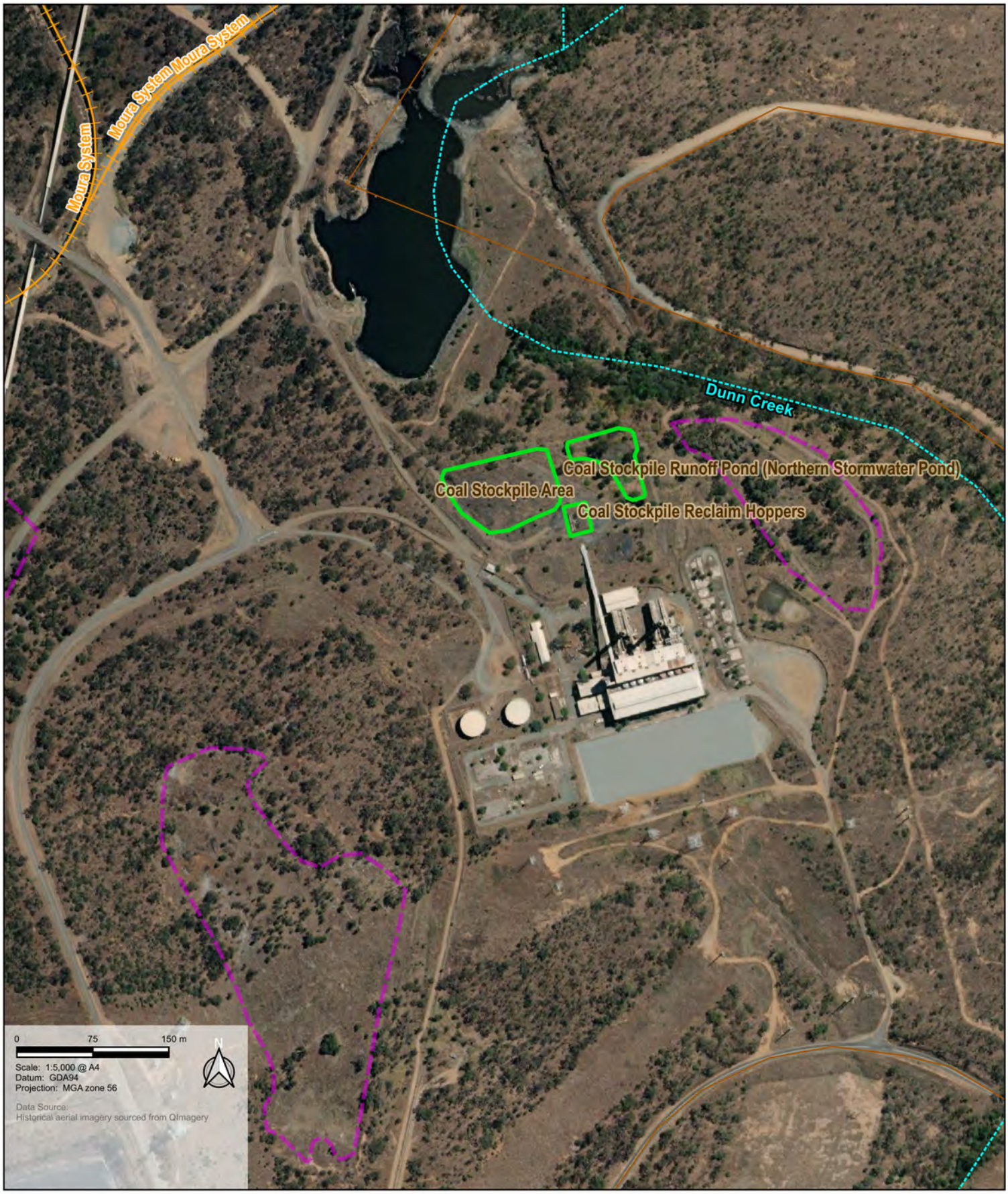
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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 2012



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Legend

Current Onsite Watercourses | Approximate Ash Dam Extent | Infrastructure (Current)

CS Energy Limited
Callide Power Station
Addendum SAQP

Appendix C
- Historical Imagery - Callide A 2021

CONTACT US

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http://www.epicenvironmental.com.au/

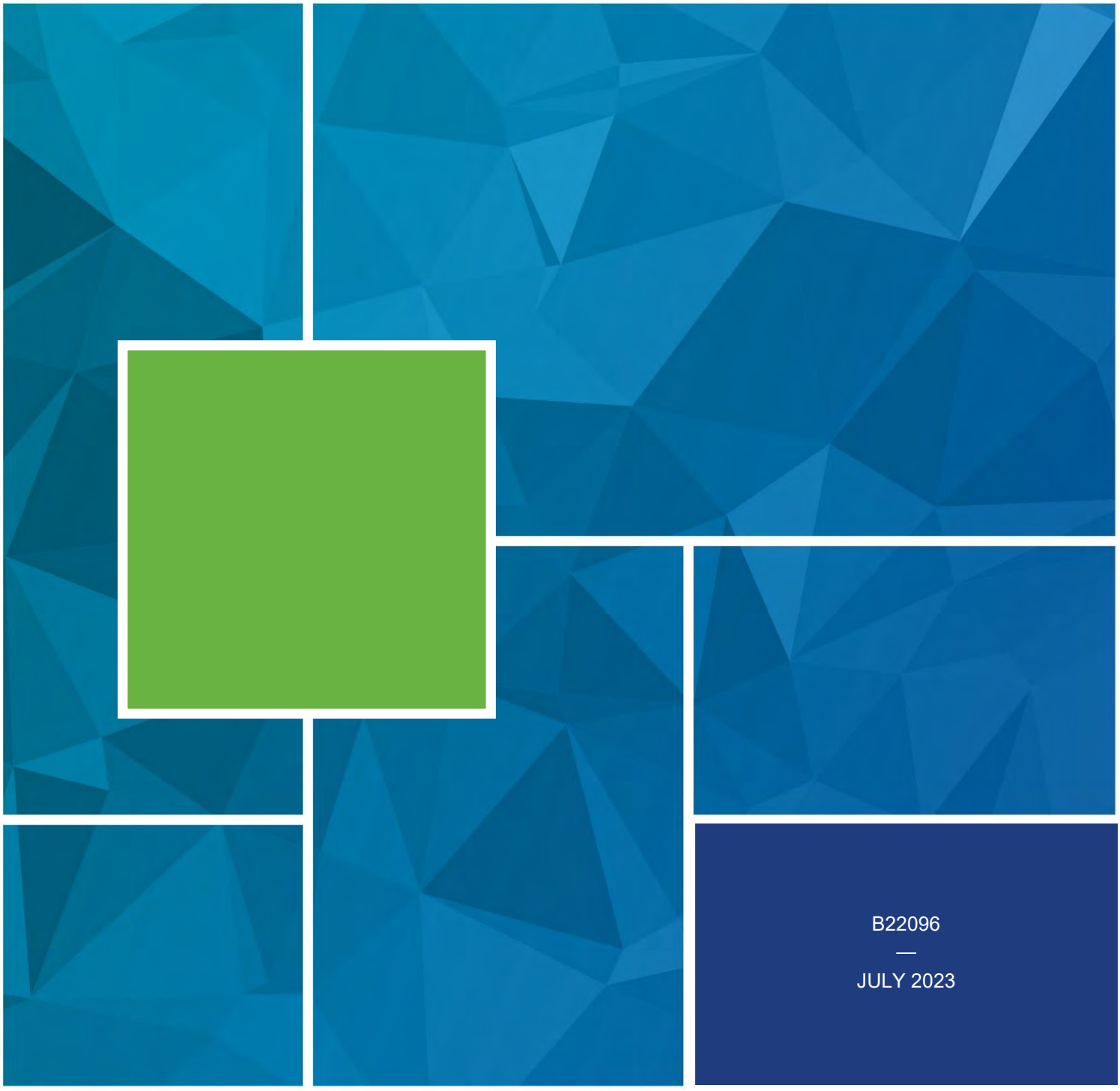
APPENDIX M CALLIDE POWER STATION ECOLOGICAL REPORT (HYDROBIOLOGY, 2023)

Hydrobiology

CALLIDE POWER STATION

BRISBANE | PERTH | SINGAPORE | PAPUA NEW GUINEA

ECOLOGICAL AND CONTAMINANTS REPORT



B22096

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JULY 2023

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EXECUTIVE SUMMARY

This report presented the finding of the aquatic ecological assessment of the Callide Creek catchment upstream and downstream of Callide Power Station (CPS). The survey involved the collection of aquatic fauna and analysis of biota tissue to inform human and ecological health risk assessments regarding per and poly fluorinated alkyl substance (PFAS) compounds and other chemicals (metals/metalloids and fluoride). The survey also aimed to determine the aquatic values of the assessed waterbodies. Aquatic values are defined as the intrinsic values of aquatic ecosystems, habitat and wildlife in waterways and riparian areas, for example, biodiversity, ecological interactions, plants, animals, key species (such as turtles, platypus, seagrass and dugongs) and their habitat, food and drinking water (DEHP, 2011).

key species (such as turtles, platypus, seagrass and dugongs) and their habitat, food and drinking water.

The survey was conducted in early February 2023, and assessed the biota tissue contaminants, habitat condition, macroinvertebrate community and aquatic biota (macrocrustaceans, fish and aquatic reptiles), of each site. Results were compared between sites and against relevant guidelines.

The habitat condition, aquatic biota, and macroinvertebrate communities varied between control/reference sites and test sites. Upstream of Callide Dam within Callide Creek habitat condition was excellent and aquatic biota and macroinvertebrates were abundant and diverse for this system. Downstream some disturbance was evident based on the state of the habitat, water quality, and macroinvertebrate assemblages. Habitat quality overall was in good to excellent condition, with most sites limited due to lower water depth, availability of micro and macrohabitats and by high fine sediment content. Lake Callide, a larger water body with sections of sheltered habitat was able to support similar, and in some cases more diverse aquatic biota and macroinvertebrates communities

than the comparable reference site Lake Kroombit. Available water quality data was scarce, however showed that site AB11 had high conductivity (2,631µS/cm) and that dissolved oxygen (%saturation) was relatively low across all sites, in particular downstream of Lake Callide.

PFOS was detected in biota samples at sites on Callide Creek both upstream and downstream of the CPS with most concentrations being above human and ecological health guidelines levels. No PFOS was detected in biota samples from Lake Callide or within Lake Kroombit. PFOS concentrations appear to increase with increasing distance downstream of CPS, with the highest concentrations recorded at the furthest downstream site. Concentration of metals and fluoride in biota samples did not show an obvious trend between control/reference and test sites. Where guidelines (generally expected levels) were available most metals/metalloids concentrations were below respective guidelines, except for zinc. However, zinc concentrations were above guideline levels regardless of species and site.

contents

1. INTRODUCTION 10
1.1 Background 10
1.2 Scope 10
1.3 Location and History 11
1.4 Catchments and Watecourses 11
1.5 Local Climate 11
1.6 Environmental Values 14
2. METHODS 16
2.1 Monitoring Aspects 16
2.2 Survey Locations 17
3. RESULTS AND DISCUSSION 19
3.1 Habitat 19
3.1.1 Habitat Condition 19
3.1.2 Banks Stability 20
3.1.3 Bed Stability 20
3.1.4 Riparian Vegetation 21
3.1.5 Macrohabitat 21
3.1.6 Microhabitat 22
3.1.7 Macrophytes 23
3.2 Water Quality 29
3.3 Macroinvertebrates 31
3.3.1 Diversity Indices 31
3.3.2 Community Assemblage 38
3.3.3 Functional Feeding Guides 41
3.3.4 AUSRIVAS Modelling 43
3.4 Fish, Macrocrustaceans, and reptiles 43
3.4.1 Fish 43
3.4.2 Macrocrustaceans 51
3.4.3 Reptiles 53
3.5 Biota Tissue Analysis 55
3.5.1 PFAS 55
3.5.2 Metals 61
3.5.3 Summary 87
4. CONCLUSION 89
5. REFERENCES 90

APPENDIX A. METHODS
APPENDIX B. QA/QC

APPENDIX C. WATER QUALITY DATA

APPENDIX D. TABULATED DATA

APPENDIX E. LABORATORY REPORTS

tables

Table 1-1 Prescribed environmental values of Callide Creek and tributaries (developed). 14

Table 2-1 Site names, treatments and locations. Coordinates provided in Geodetic Datum of Australia (GDA) 2020. 17

Table 3-1 Site descriptions and habitat assessment 24

Table 3-2 OE50 scores from the March 2023 data. Bands are indicated in brackets and by cell colour; dark green (X) = more biologically diverse than reference site; light green (A) = reference condition; yellow (B) = significantly impaired; orange (C) = severely impaired; red (D) = extremely impaired. 43

Table 3-3 Comparison of Callide Creek main trunk fish WQOs to observed fish diversity indices of each assessed reach. Highlighted values indicate non-conformance with the defined biological WQO... 44

Table 3-4 Fish captured in March 2023 survey. 47

Table 3-5 Minimum, maximum and average lengths (mm) of taxa recorded at each site. 48

Table 3-6 Macrocrustaceans captured in March 2023 survey. 52

Table 3-7 Aquatic reptiles captured in March 2023 survey. 54

Table 3-8 Human and ecological health species caught and selected for analysis. 56

Table 3-9 Biota tissue analysis results summary. 87

Table 5-1 Primary samples and their respective duplicate/triplicate samples. 99

Table 5-2 Summary of human health screening criteria, extracted from NEMP (2020) 100

Table 5-3 Summary of ecological screening criteria, extracted from NEMP (2020). 101

Table 5-4 GELs used in the current study. Units in mg/kg. 101

Table 5-5 Duplicate tissue analysis QA/QC results. Shaded cells represent RPD >50%. 104

Table 5-6 Triplicate tissue analysis QA/QC results. 107

Table 5-7 Rinsate and dilute Aqui-s QA/QC analysis results 110

Table 5-8 In-situ water quality data provided by client. 114

figures

Figure 1-1 Long term (LT) monthly mean rainfall, maximum and minimum temperature statistics from the Biloela climate station 039290 (BOM, 2023). 12

Figure 1-2 CPS with infrastructure and other points of interest 13

Figure 2-1 Monitoring sites with watercourses, infrastructure and other points of interest 18

Figure 3-1 Habitat assessment scores of wetland (left) and non-wetland (right) sites with bands indicating the upper limit of each condition grade. Solid lines indicative of River Bioassesmment Program grades, dashed lines indicative of adapted scores for wetland sites. 20

Figure 3-2 Particles size contribution to overall substrate. 21

Figure 3-3 Riparian vegetation contribution (%). 21

Figure 3-4 Macrohabitat contribution. 22

Figure 3-5 Microhabitat contribution 22

Figure 3-6 Contribution of macrophytes to overall assemblage 23

Figure 3-7 pH levels at study sites with dotted lines indicating WQO maximums and straight lines indicating WQO minimums. 30

Figure 3-8 Dissolved oxygen (% saturation) levels at study sites with dotted lines indicating WQO maximums and straight lines indicating WQO minimums. 30

Figure 3-9 Electrical conductivity (EC, µS/cm) levels at study sites with dotted lines indicating maximum EC defined under the Callide Creek catchment WQOs. WQO only applicable for water courses, therefore not applicable to sites AB2, AB3 and AB9. 31

Figure 3-10 Macroinvertebrate abundance at edge habitats (top) and bed habitats (bottom) 33

Figure 3-11 Macroinvertebrate taxa richness at edge habitats (top) and bed habitats (bottom). 34

Figure 3-12 Macroinvertebrate PET taxa richness at edge habitats (top) and bed habitats (bottom). 35

Figure 3-13 Macroinvertebrate SIGNAL2 score at edge habitats (top) and bed habitats (bottom 36

Figure 3-14 Macroinvertebrate percentage contribution of tolerant taxa at edge habitats (top) and bed habitats (bottom). 37

Figure 3-15 Contribution to overall macroinvertebrate assemblage from dominant taxa (dominant 90%) within edge habitat 39

Figure 3-16 Contribution to overall macroinvertebrate assemblage from dominant taxa (dominant 90%) within bed habitat 40

Figure 3-17 Functional Feeding Guides (FFGs) of macroinvertebrate taxa (high contributing species -90%) within edge (top) and bed (bottom) habitats. FFGS present in the study included filtering collectors (FC), gathering/filtering collectors (GC/FC), gathering collectors (GC), predators (P), predators/gat5hering collectors (P/GC), predators/gathering collectors/filtering collectors (P/GC/FC), predators/macrophyte piercers (P/MP), predators/scavengers (P/Sv), predators/ scrapers (P/S), predators/scrapers/gathering collectors (P/S/GC), predators/scrapers/parasites (P/S/PA), predators/shredders (P/Sh), scrapers (S), scrapers/gathering collectors (S/GC). 42

Figure 3-18 Abundance and taxa richness of fish caught at all sites. .. 46

Figure 3-19 Abundance and taxa richness of macrocrustaceans caught at all sites - no macrocrustaceans were captured or observed at AB5, AB6 or AB8. 51

Figure 3-20 Abundance and taxa richness of reptiles caught at all sites - no reptiles were captured or observed at AB14. 53

Figure 3-21 PFOS measured from human health target species. Green line represents human health guideline value (NEPM, 2020). 58

Figure 3-22 PFOS measured from ecological health target species. Lines represents avian (blue) and mammalian (red) diet ecological guideline values (NEMP, 2020). 60

Figure 3-23 Arsenic concentration in biota tissue. 63

Figure 3-24 Barium concentration in biota tissue. 66

Figure 3-25 Chromium concentration in biota tissue. 69

Figure 3-26 Copper concentration in biota tissue. Green lines represent GELs (ANZFA, 2001). 72

Figure 3-27 Molybdenum concentration in biota tissue. 74

Figure 3-28 Selenium concentration in biota tissue. Green lines represent GELs (ANZFA, 2001). 77

Figure 3-29 Strontium concentration in biota tissue. 80

Figure 3-30 Vanadium concentration in biota tissue. 81

Figure 3-31 Zinc concentration in biota tissue. 83

Figure 3-32 Thorium concentration in biota tissue. 85

Figure 3-33 Fluoride concentration in biota tissue. 86

1. INTRODUCTION

1.1 BACKGROUND

In December 2021, CS Energy Limited (CS Energy) was issued with a notice to conduct or commission an Environmental Evaluation (EE) to investigate and assess the source, cause and extent of any actual or potential environmental harm resulting from the historical use of Aqueous Film Forming Foam (AFFF) at the Callide Power Station (hereafter referred to as CPS). A Sampling Analysis and Quality Plan (SAQP) was prepared by Epic Environmental on 28 February 2022 (Epic Environmental, 2022) to address Requirement 3 of the EE.

The SAQP outlined the need to conduct a desktop review to facilitate the design of an appropriate aquatic biota sampling that would adequately address the requirements of the EE pertaining to human and/or ecological health risks arising from human consumption of aquatic biota as well as bioaccumulation within the food chain.

Epic completed the desktop review in accordance with the SAQP and as an outcome of this review designed a biota sampling strategy which was then implemented by Hydrobiology in 2023.

1.2 SCOPE

Hydrobiology was contracted to conduct the fieldwork and reporting as stipulated by the SAQP, including:

- Habitat assessments;
- Macroinvertebrate sampling; and

- Collection of aquatic biota to inform the human and ecological health risk assessments. The original scope of works included the assessment of PFAS; however Hydrobiology were requested to subsequently include the assessment of the following parameters, including:
  - Metals and metalloids.
    - arsenic, barium, boron, chromium, copper, lithium, molybdenum, selenium, strontium, thorium, uranium, vanadium, zinc.
    - Fluoride.

1.3 LOCATION AND HISTORY

CPS is located within the Callide Basin in the Banana Shire region of Queensland, approximately 10 km east of the Biloela township and approximately 110 km south of Rockhampton. CPS comprises three coal-fired power plants supplied by the nearby Callide mine (Figure 1-2). The first, Callide A, was opened in 1965 but was decommissioned in 2001, except for a single unit which was used to demonstrate carbon capture technology and was decommissioned in 2016. The other two power stations, Callide B and Callide C, remain active. Callide B was commissioned in 1988 and is owned by CS Energy, whereas Callide C was commissioned in 2001 and is owned in a 50/50 venture between CS Energy and IG Power (formerly known as InterGen).

1.4 CATCHMENTS AND WATECOURSES

The study area is located within the Callide Creek catchment within the Dawson River sub-basin. With the exception of one site, all sites are located within Callide Creek, upstream, downstream and within Callide Dam. The remaining site is located within Kroombit Dam on Kroombit Creek.

A map of the project location and site positions are provided in Section 2.2.

1.5 LOCAL CLIMATE

The climate for the area is typical of the region, with high daytime summer temperatures and mild winters (Figure 1-1). Rainfall is variable, with most rain falling during the warmer months from mid-October to mid-March. Above average rainfall occurred in the months preceding monitoring in February 2023. In the weeks leading up to the survey, a total of 31 mm was recorded, while a total of 19 mm of rain was recorded within the survey period (30th January to 3rd February 2023).

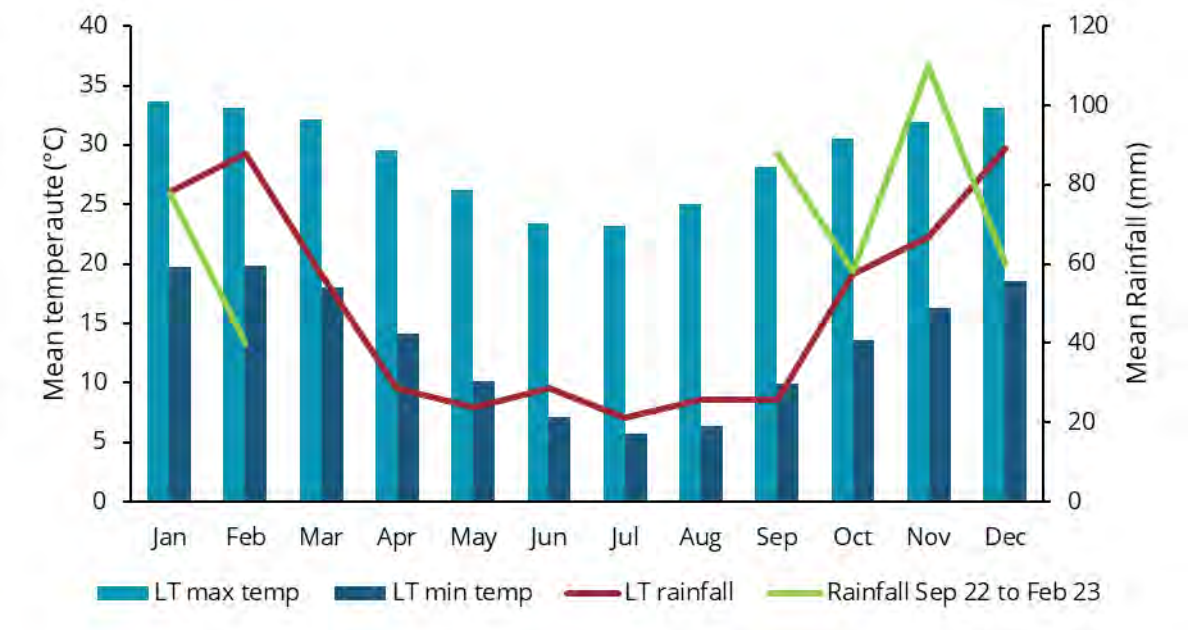


Figure 1-1 Long term (LT) monthly mean rainfall, maximum and minimum temperature statistics from the Biloela climate station 039290 (BOM, 2023).



Figure 1-2 CPS with infrastructure and other points of interest

1.6 ENVIRONMENTAL VALUES

EVs are the qualities of waterways that need to be protected from the effects of pollution, waste discharges and other threats (such as runoff from agricultural lands) to ensure aquatic ecosystems are healthy and the waterways continue to provide essential ecosystem services. There are a range of EVs applicable to waterways in Queensland. These include the value of the waterways to aquatic ecosystems, primary industries, recreation and aesthetics, drinking water, industrial uses as well as cultural and spiritual values. DEHP (2011) defines EVs for the Callide Creek Catchment within the Dawson River Sub-Basin in which CPS is located. DEHP (2011) sets out a framework for EVs which are defined for tributaries and regulated and unregulated waters of Callide Creek Catchment. Those most relevant to the survey sites are the Callide Creek tributaries (developed) and Upper Kroombit Creek and tributaries (Table 1-1).

Table 1-1 Prescribed environmental values of Callide Creek and tributaries (developed).

Label	Environmental Value	Description	Callide Creek and tributaries—developed areas	Upper Kroombit Creek and tributaries
	Aquatic ecosystem	The intrinsic value of aquatic ecosystems, habitat and wildlife in waterways, waterholes and riparian areas, for example, biodiversity, ecological interactions, plants, animals, key species and their habitat, food and drinking water. EV were designed for the protection of moderately disturbed systems (i.e. 95% biota protection trigger).	✓	✓
	Irrigation	Suitability of water supply for irrigation, for example, irrigation of crops, pastures, parks, gardens and recreational areas.	✓	✓
	Farm supply	Suitability of domestic farm water supply, other than drinking water. For example, water used for laundry and produce preparation.	✓	✓
	Stock watering	Suitability of water supply for production of healthy livestock.	✓	✓
	Aquaculture	Health of aquaculture species and humans consuming aquatic foods (such as fish and prawns) from commercial ventures.		✓
	Human consumption	Health of humans consuming aquatic foods, such as fish and prawns, from natural waterways.	✓	✓

Label	Environmental Value	Description	Callide Creek and tributaries—developed areas	Upper Kroombit Creek and tributaries
	Primary recreation	Health of humans during recreation which involves direct contact and a high probability of water being swallowed, for example, swimming, diving and water-skiing.	✓	✓
	Secondary recreation	Health of humans during recreation which involves indirect contact and a low probability of water being swallowed, for example, wading, boating, rowing and fishing.	✓	✓
	Visual appreciation	Amenity of waterways for recreation which does not involve contact with water. For example, walking and picnicking adjacent to a waterway.	✓	✓
	Drinking water	Suitability of raw drinking water supply. This assumes minimal treatment of water is required, for example, coarse screening and/or disinfection.	✓	✓
	Industrial	Suitability of water supply for industrial use, for example, food, beverage, paper, petroleum and power industries, mining and minerals refining/processing. Industries usually treat water supplies to meet their needs.	✓	
	Cultural and spiritual values	Cultural, spiritual and ceremonial values of water means its aesthetic, historical, scientific, social or other significance, to the past, present or future generations.	✓	✓

2. METHODS

2.1 MONITORING ASPECTS

Sampling was conducted at nine sites following the methods specified in the Sampling Analysis and Quality Plan (SAQP) (Epic Environmental, 2022) and under the following codes of practice and State or Commonwealth guidelines:

- DES (2018) – *Deciding aquatic ecosystems indicators and local water quality guidelines;*
- DES (2018) – *Monitoring and Sampling Manual;*
- DES (2014) - *Receiving Environment Monitoring Program guideline - For use with Environmental Relevant Activities under the Environmental Protection Act (1994);*
- Department of Natural Resources and Mines (DNRM) (2001). *Queensland, Australian River Assessment System (AUSRIVAS) Sampling and Processing Manual;*
- DEHP (2011) - *Environmental Protection (Water) Policy (2009) Callide Creek Catchment Environmental Values and Water Quality Objectives Relevant state and national standards*; and
- (Queensland Health, n.d.) - *Guideline for sampling and analysis of seafood suitable for human health risk assessments of PFAS contamination*.

Details regarding sample collection methods, analysis and QA/QC approaches for each monitoring aspect are discussed in Appendix B. Relevant guideline values and explanations of macroinvertebrate analysis (including definitions of indices and AUSRIVAS scores) are also discussed in Appendix A. The results of implemented QA/QC are discussed in Appendix B.

2.2 SURVEY LOCATIONS

As part of the scope of works (Epic Environmental, 2022), nine sites within and adjacent to the CPS were surveyed during the 30th January to 3rd February 2023 period (see Table 2-1 and Figure 2-1).

Sites were positioned spatially over a longitudinal grade and separated by treatments (test, control, and reference sites). Test sites were positioned downstream of CP, therefore potentially impacted. Control sites were positioned upstream from CP within the Callide Creek, away from potential impacts. Reference sites were positioned in the same basin as control and test sites but in a separate catchment, therefore providing context of PFAS levels withing the wider region.

Table 2-1 Site names, treatments and locations. Coordinates provided in Geodetic Datum of Australia (GDA) 2020.

Site	Waterway/region	Treatment	Habitat	Coordinates	
				Latitude	Longitude
AB9	Lake Kroombit	Reference	Lacustrine	-24.4156	150.773
AB1	Upstream Callide Creek	Control	Riverine	-24.3271	150.6762
AB2	Lake Callide	Test	Lacustrine	-24.3580	150.6258
AB3	Lake Callide	Test	Lacustrine	-24.3687	150.6161
AB4	Downstream Callide Creek	Test	Riverine	-24.3641	150.6072
AB5	Downstream Callide Creek	Test	Riverine	-24.3793	150.5604
AB6	Downstream Callide Creek	Test	Riverine	-24.3702	150.5307
AB7	Downstream Callide Creek	Test	Riverine	-24.3593	150.4987
AB8	Downstream Callide Creek	Test	Riverine	-24.3462	150.4761

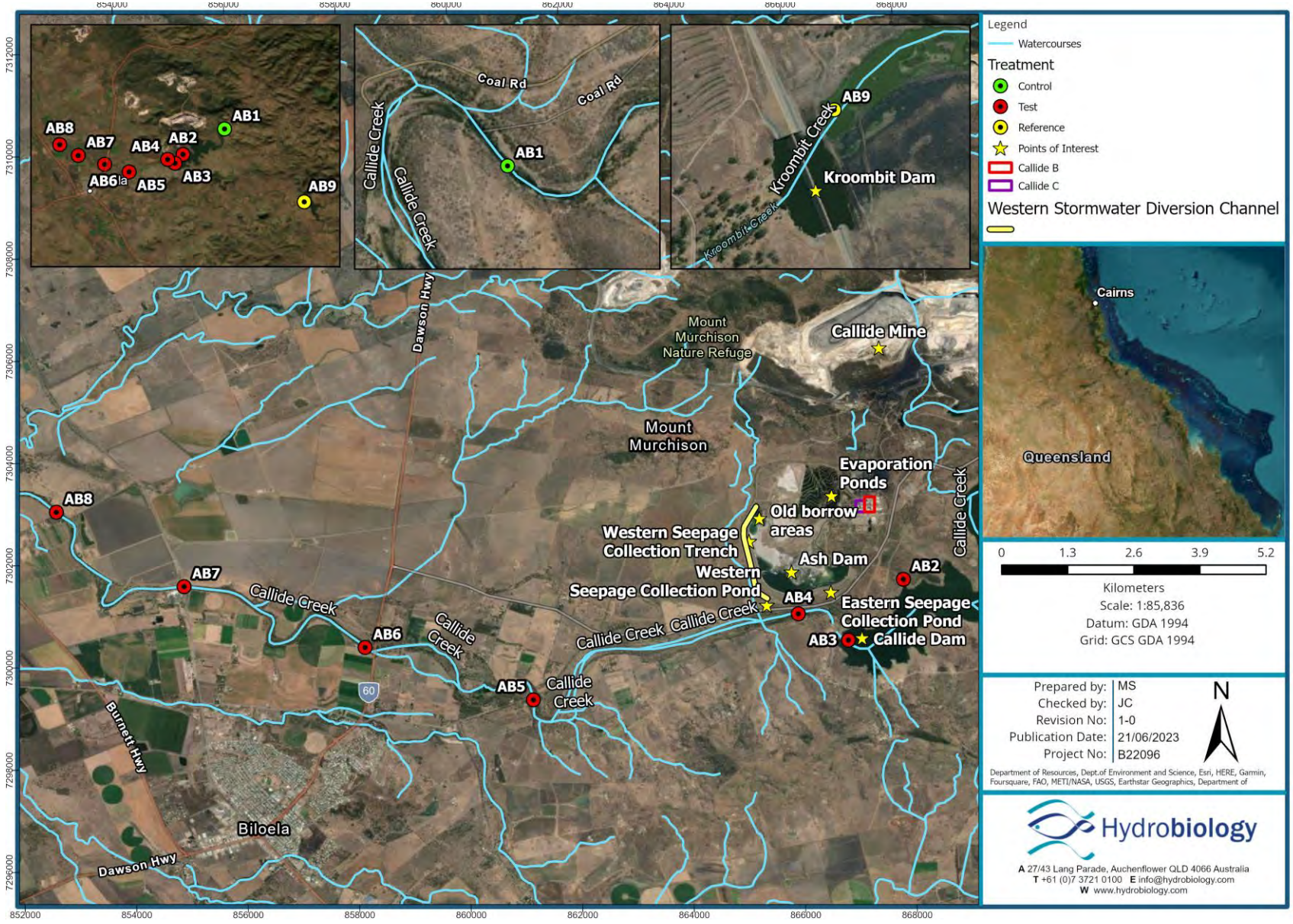


Figure 2-1 Monitoring sites with watercourses, infrastructure and other points of interest

3. RESULTS AND DISCUSSION

Field datasheets are displayed in Appendix C.

3.1 HABITAT

Site photos and descriptions can be found in Table 3-1. Results are presented spatially over a longitudinal gradient.

3.1.1 HABITAT CONDITION

The study area contained a mix of lacustrine and riverine habitats, which required a mix of traditional and adjusted habitat assessments. Most sites were riverine sites and could be assessed using the traditional habitat assessment defined by AUSRIVAS, however AB2, AB3 and AB9 were assessed under a different metric. Regardless of how the scores were classified, all sites were graded as being in poor, fair, good or excellent condition, however the required scores for each band varied between sites (see Appendix A for more details).

Habitat condition of all riverine sites ranged from good to excellent (Figure 3-1). The habitat condition of the control site AB1 was scored “excellent” whereas all sites downstream of Lake Callide were scored as “good”. In comparison to AB1 sites downstream were largely limited by decreased bottom

substrate variability (greater proportion of fines content), high embeddedness (i.e., minimal interstitial spacing), the limited depth and variability of macrohabitat (i.e. restricted to pools while riffles and runs were absent) and the coverage of streamside vegetation due to clearing.

Wetland sites AB9 and AB2 were in good condition, however site AB3 was classified as fair. All sites were hindered by lack of substrate variability, macrohabitat availability and the dominance of grasses as the primary riparian vegetation.

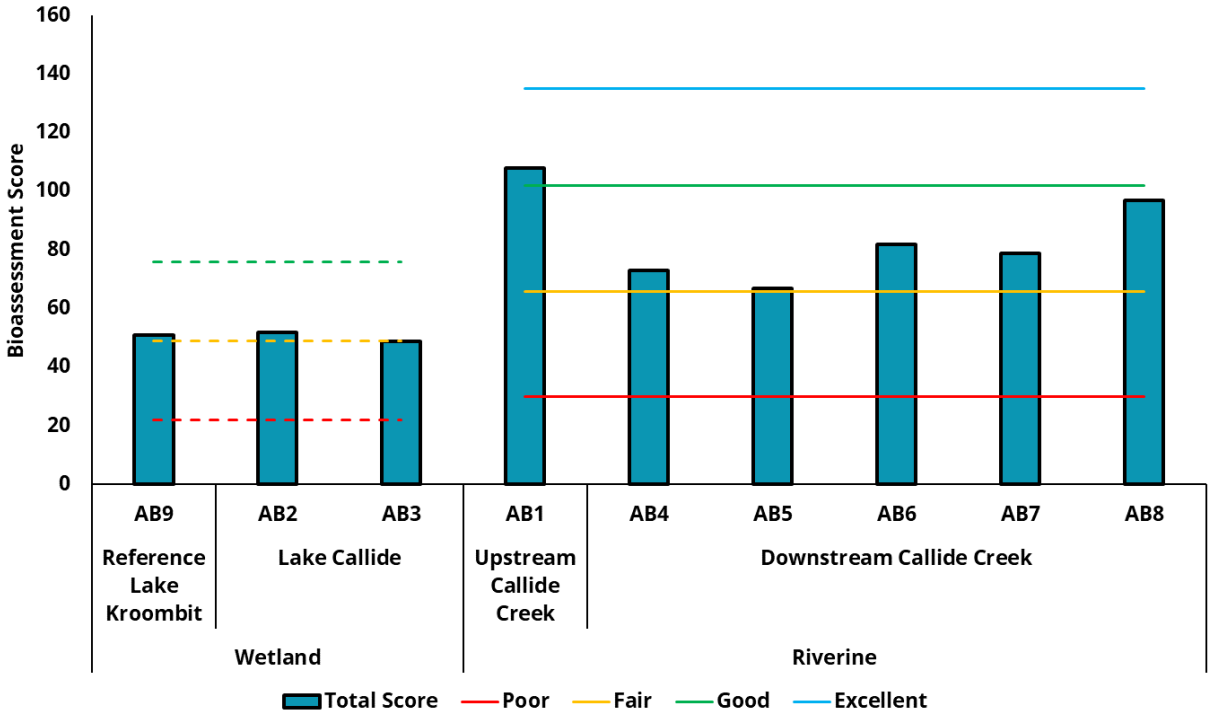


Figure 3-1 Habitat assessment scores of wetland (left) and non-wetland (right) sites with bands indicating the upper limit of each condition grade. Solid lines indicative of River Bioassesmment Program grades, dashed lines indicative of adapted scores for wetland sites.

3.1.2 BANKS STABILITY

The bank stability of all sites were classified as good to excellent. Most banks were stable or moderately stable, with little evidence of erosion. Some sites however had reduced streambank cover. The streambank surfaces of all sites were at least 50% covered in vegetation, gravel or larger material.

3.1.3 BED STABILITY

Overall, bed stability of all sites ranged from good to excellent, with little evidence of scouring and some deposition of fine sediment. Most test sites had low to loose compaction of the bed material, with little to no grading, packing, structure or overlapping of substrate particles meaning it could be easily dislodged, except for test site AB8 which had moderate bed compaction. Control site AB1 was the only site to record tight compaction of the bed material.

For most sites, bed stability could be linked to the substrate composition which was overall dominated by silt/clay sediments (Figure 3-2). In contrast, AB1 which contained tight compaction of the bed material contained larger particles of sand, pebbles and cobble, exposed bedrock as well as silt/clay sediment. While silt/clay was less prevalent at site AB8, larger sediments were more abundant, making it more similar to upstream conditions at AB1.

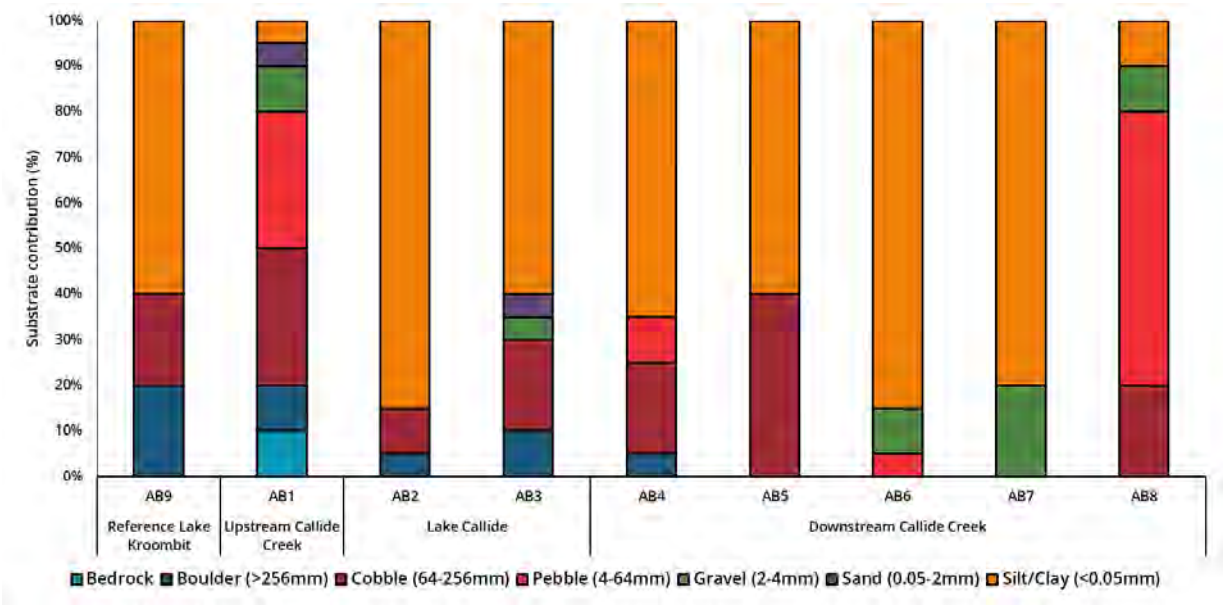


Figure 3-2 Particles size contribution to overall substrate.

3.1.4 RIPARIAN VEGETATION

The riparian vegetation associated with lake habitats was largely cleared, with trees often scarce and the banks dominated by grasses and/or bare ground (Figure 3-3). Exotics grass and pasture species were present at most sites to some degree. At Callide Creek sites, clearing was reduced and the riparian vegetation still contained patches of trees interspersed by grasses and shrubs.

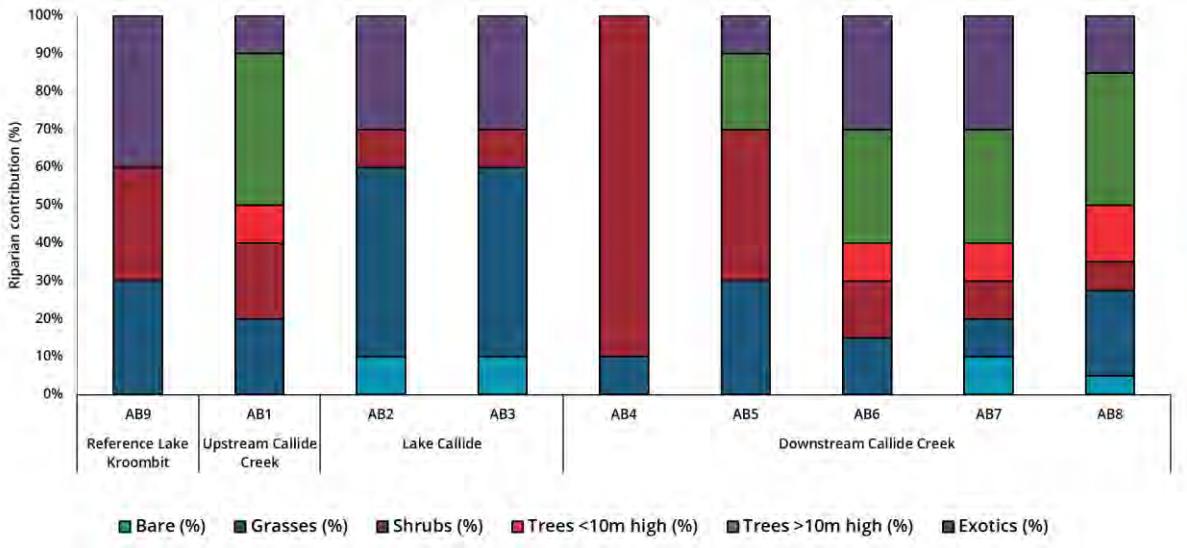


Figure 3-3 Riparian vegetation contribution (%).

3.1.5 MACROHABITAT

Macrohabitat lacked diversity across each site, with most sites comprised of only one macrohabitat (Figure 3-4). Downstream sites AB7 and AB8 were most like the control site as rocky pool habitat was present. All other sites were comprised of sandy/silt pools.

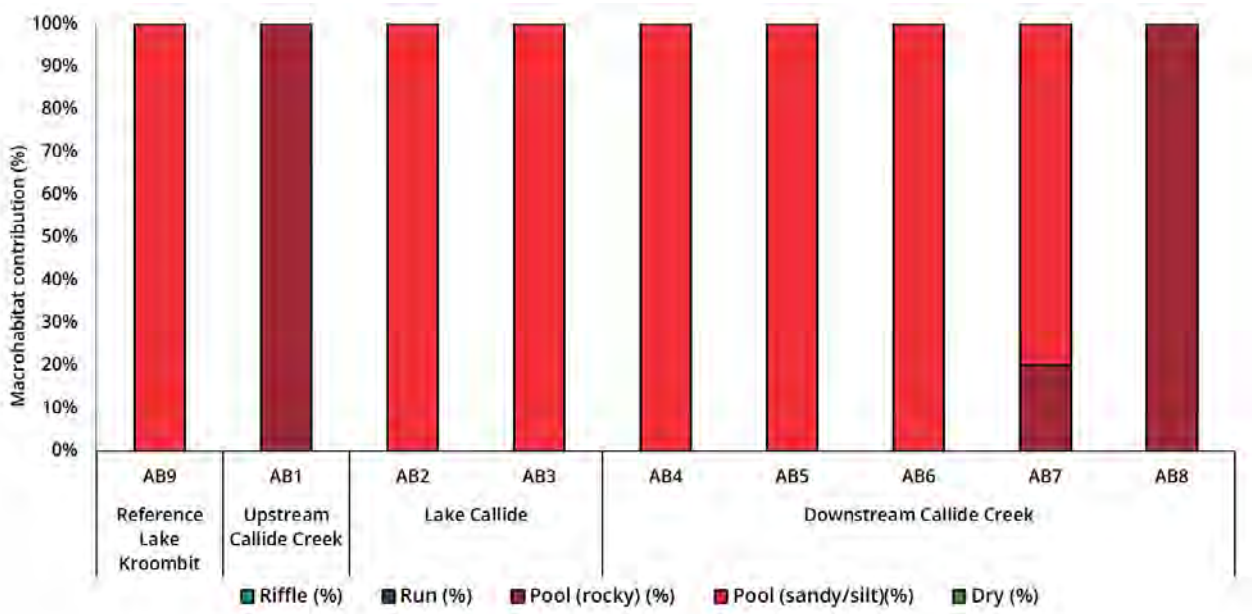


Figure 3-4 Macrohabitat contribution.

3.1.6 MICROHABITAT

Microhabitat was predominantly provided by small woody debris (SWD) and detritus. Periphyton and large woody debris (LWD) were each present in smaller quantities but also commonly present (Figure 3-5). Undercut banks were present at three sites (AB1, AB6 and AB8). Some microhabitat was also provided by the macrophytes, and algae present to varying degrees.

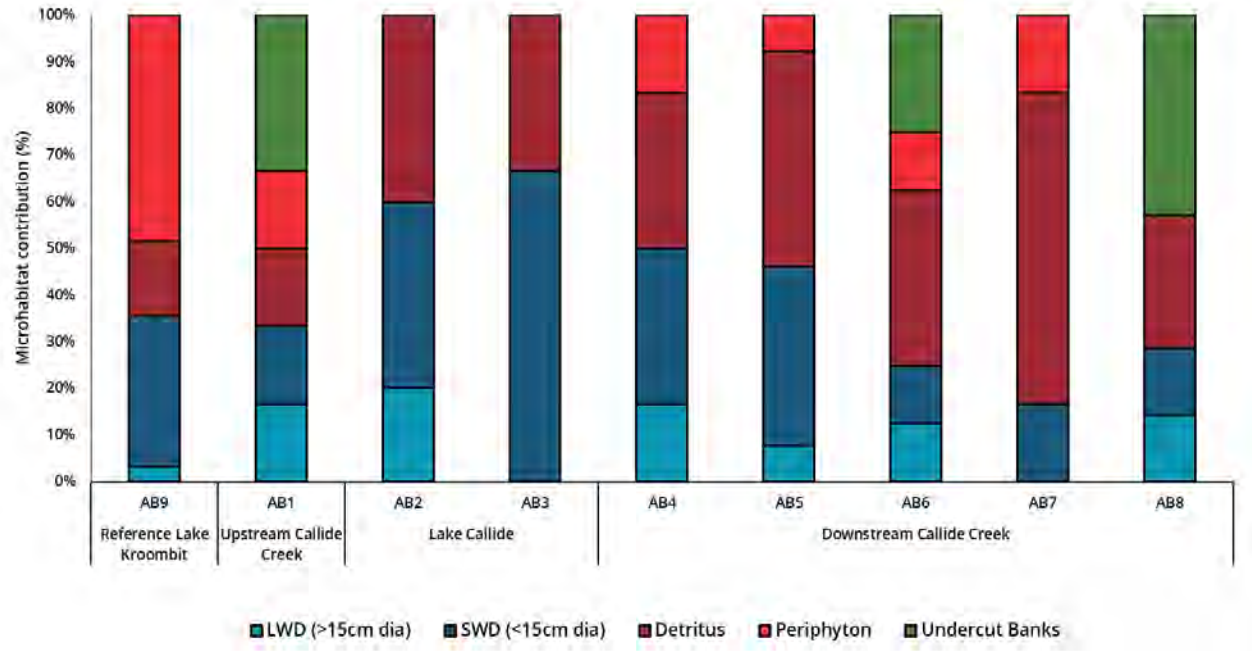


Figure 3-5 Microhabitat contribution

3.1.7 MACROPHYTES

Macrophytes were present at all sites, and they were largely found along edge habitats; however some macrophytes were also present within the pool habitat (Figure 3-6). Several downstream creek sites were dominated by either *Hydrilla* sp. or *Typha* sp. but typically also had other species present. The reference site at Lake Kroombit was dominated by *Persicaria sp.* whereas within Lake Callide taxa such as charophytic algae were more common. The most diversity and species evenness was observed at the upstream Callide Creek control site AB1 where most taxa found at across the rest of the study area were present. Taxa absent from this site were *Persicaria* sp., *Nymphoides* sp., and *Ceratophyllum* sp.

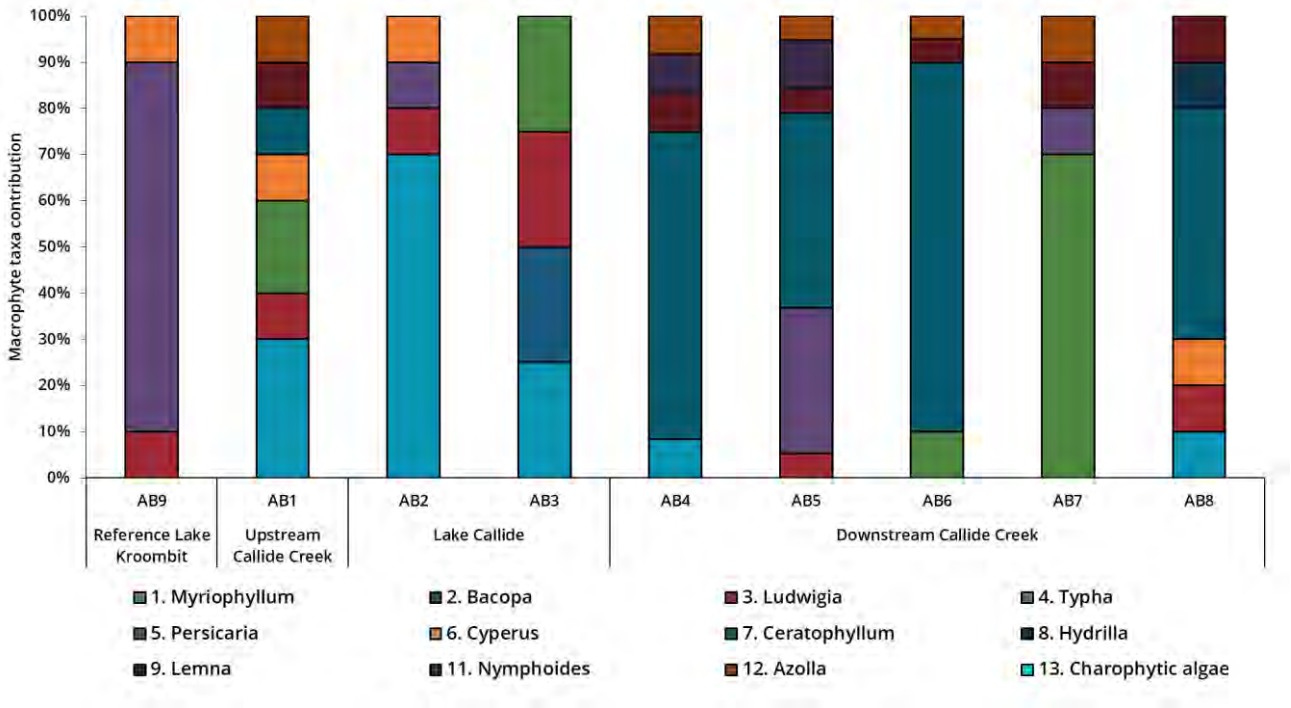


Figure 3-6 Contribution of macrophytes to overall assemblage

Table 3-1 Site descriptions and habitat assessment

Site	Feature	Upstream	Downstream
AB9	**Watercourse:** Lake Kroombit Dam **Local landuse:** Reservoir, native vegetation **Bed erosion and sedimentation**: Less than 5% of the bottom impact by sedimentation or scouring, no sediment deposition evident. **Banks:** Circular pond. Banks convex shaped with slight (10-30°) side slope. Banks are stable, with no evidence of erosion or bank failure. Little potential for future problem. At least 80% of banks covered by vegetation or large particles. **Bed substrate:** Dominated by silt/clay (60%) with smaller, equal coverage of cobble and boulder (20. Low compaction of bed material, poor grading, some packing and structure but little overlap and can be dislodged easily. Habitat provided by boulders/cobbles at edge. **Macrohabitat:** Entirely sandy/silty pool. **Microhabitat**: Detritus (5%), and SWD (10%) present. Macrophytes prevalent (60%) and algae present (15%), both limited to the bank edges. **Riparian vegetation:** Isolated shrubs (30%) among grasses (30%) and exotics (40%), no trees. **Habitat bioassessment score**: 51, good condition		
AB1	**Watercourse:** Upstream Callide Creek **Local landuse:** Native vegetation and roads **Bed erosion and sedimentation**: Less than 5% of the bottom impact by sedimentation or scouring, no sediment deposition evident. **Banks:** Convex shaped banks with steep (60-90°) left side slope and flat to low (0-30%) right side slope. Banks are stable, with no evidence of erosion or bank failure. Little potential for future problem. At least 80% of banks covered by vegetation or large particles. **Bed substrate:** Mixture of mostly cobble and pebble (30%) with some small, equal presence of bedrock, boulder and gravel (10%). Slight, equal presence of sand and silt/clay (5%). Tightly packed, armoured – array of sizes, tightly packed, overlapping and hard to dislodge. **Macrohabitat:** Entirely rocky pool. **Microhabitat**: Some undercut banks (20%), with small, equal coverage from LWD, SWD, detritus and periphyton (10%) Macrophytes (40% total - 50% edge, 50% pool) and filamentous algae (20% total – 50% edge, 50% pool) also present. **Riparian vegetation:** Contiguous riparian vegetation. Dominant vegetation of tree form (40%), with understory of shrubs (20%) and grasses (20%). Some presence of exotics (10%). **Habitat bioassessment score**: 108, excellent condition		

Site	Feature	Upstream	Downstream
AB2	**Watercourse:** Lake Callide **Local landuse:** Reservoir, native vegetation (cleared), road, residential and farm infrastructure **Bed erosion and sedimentation**: Less than 5% of the bottom impact by sedimentation or scouring, no sediment deposition evident. **Banks:** Convex shaped banks slight (10-30°) side slopes. Banks are stable, with no evidence of erosion or bank failure. Little potential for future problem. At least 80% of banks covered by vegetation or large particles. **Bed substrate:** Dominated by silt/clay (90%) with some areas of cobble (10%) and boulder (5%). Loose compaction of bed, loose array of particles with no packing or structure or overlap and is easily moved. **Macrohabitat:** Entirely sandy/silt pool. **Microhabitat**: Limited. Small, equal presence of small woody debris and detritus (10%) and slight presence of large woody debris (5%). Macrophytes (35%) present at edge and algae (50%) mostly present at edge (90%) with some present within the pool (10%). **Riparian vegetation:** Occasional shrubs (10%) among native (50%) and exotic grasses and pastures (30%). **Habitat bioassessment score**: 49, fair condition		
AB3	**Watercourse:** Lake Callide **Local landuse:** Native vegetation (cleared), reservoir, residential and farming infrastructure. **Bed erosion and sedimentation**: Less than 5% of the bottom impact by sedimentation or scouring, no sediment deposition evident. **Banks:** Convex shaped banks with low (10-30°) side slopes. Banks are stable, with no evidence of erosion or bank failure. Little potential for future problem. At least 90% of banks covered by vegetation or large particles. **Bed substrate:** Dominated by silt/clay (60%), with some cobble (20%), some boulder (10%) and small, equal presence of gravel and sand particles (5%). Loose compaction of bed, loose array of particles with no packing or structure or overlap and is easily moved. **Macrohabitat:** Entirely sandy/silt pool. **Microhabitat**: Limited. Small presence of small woody debris (10%) and slight presence of detritus (5%). Macrophytes (20%) present at edge and algae (30%) mostly present at edge (90%) with some present within the pool (10%). **Riparian vegetation:** Mostly cleared habitat with occasional shrubs (10%) among native (50%) and exotic grasses and pastures (30%). **Habitat bioassessment score**: 52, good condition		

Site	Feature	Upstream	Downstream
AB4	**Watercourse:** Callide Creek, below dam spillway. **Local landuse:** Native vegetation, wetland and road/access tracks. **Bed erosion and sedimentation**: Less than 5% of the bottom impact by sedimentation or scouring, no sediment deposition evident. **Banks:** Convex shaped, flat (0-10°) banks. Banks are stable, with no evidence of erosion or bank failure. Little potential for future problem. At least 80% of banks covered by vegetation or large particles. **Bed substrate:** Dominated by silt/clay (65%). Some cobble (20%), small presence of pebble (10%) and slight presence of boulder (5%0. Loose compaction of bed material – loose array of poorly packed or structured particles with little overlap and can be moved easily. **Macrohabitat:** Entirely sandy/silt pool **Microhabitat**: Some blanketing silt, some small, equal presence of SWD and (10%) and some slight, equal presence of LWD and periphyton (5%). Copious, equal amounts of filamentous algae and macrophytes (90%) within the pool (50%) and edge (50%). **Riparian vegetation:** Dominated by shrubs (90%) with isolated patches of native grasses (10%), essentially a wetland. **Habitat bioassessment score**: 73, good condition		
AB5	**Watercourse:** Downstream Callide Creek. **Local landuse:** Native vegetation, wetland and farm/residential infrastructure. **Bed erosion and sedimentation**: Less than 5% of the bottom impact by sedimentation or scouring, no sediment deposition evident. **Banks:** Convex shaped, flat (0-10°) banks. Banks are stable, with no evidence of erosion or bank failure. Little potential for future problem. At least 80% of banks covered by vegetation or large particles. **Bed substrate:** Dominated by silt/clay (60%), some cobble (40%). Loose compaction of bed material – loose array of poorly packed or structured particles with little overlap and can be moved easily. **Macrohabitat:** Entirely sandy/silt pool **Microhabitat**: Abundant detritus (30%) and SWD (25%) with equal, small presence of LWD and periphyton (5%). Blanketing silt present. Copious, equal amounts of filamentous algae and macrophytes (90%) within the pool (50%) and edge (50%). **Riparian vegetation:** Isolated/scattered trees (20%) amongst native grasses (30%) and exotic pasture grasses (10%) and shrubs (40%). **Habitat bioassessment score**: 67, good condition		

Site	Feature	Upstream	Downstream
AB6	**Watercourse:** Downstream Callide Creek **Local landuse:** Native vegetation (cleared), irrigated cropping, wetland and road, and farm/residential infrastructure. **Bed erosion and sedimentation**: Less than 5% of the bottom impact by sedimentation or scouring, no sediment deposition evident. **Banks:** Convex shaped banks with low (10-30°) side slopes. Banks are stable, with no evidence of erosion or bank failure. Little potential for future problem. At least 90% of banks covered by vegetation or large particles. **Bed substrate:** Dominated by silt/clay (85%) with some gravel (10%) and slight presence of pebble (5%). Loose compaction of bed material – loose array of poorly packed or structured particles with little overlap and can be moved easily. Lack of habitat provide by substrate obvious. **Macrohabitat:** Entirely sandy/silt pool **Microhabitat**: Some undercut banks (10%) and detritus (15%) with equal, small presence of SWD, LWD and periphyton (5%). Abundant macrophytes (75%) mostly within pool (70%) and some edge (30%). Some algae (20%) within the pool (100%). **Riparian vegetation:** Cleared patches of trees (40%) amongst exotic pasture grasses (30%), and small, equal patches of native grasses and shrubs (15%). **Habitat bioassessment score**: 82, good condition		
AB7	**Watercourse:** Downstream Callide Creek. **Local landuse:** Wetland and native vegetation partially cleared for road infrastructure. Irrigated cropping upstream and piggery downstream. **Bed erosion and sedimentation**: Less than 5% of the bottom impact by sedimentation or scouring, no sediment deposition evident. **Banks:** Convex shaped, flat (0-10°) banks. Banks are stable, with no evidence of erosion or bank failure. Little potential for future problem. At least 80% of banks covered by vegetation or large particles. **Bed substrate:** Entirely silt/clay. Loose compaction of bed material – loose array of poorly packed or structured particles with little overlap and can be moved easily. Lack of habitat provide by substrate obvious. **Macrohabitat:** Mostly sandy/silt pool (80%) with some rocky pool (20%). **Microhabitat**: Some detritus (20%) with equal, small presence of SWD and periphyton (5%). Blanketing silt present. Small presence of macrophytes (10%) predominantly at edge (90%) and some within pool (10%). Algae present (10%) at edge (100%). **Riparian vegetation:** Cleared patches of trees (40%) amongst exotic pasture grasses (30%), and small, equal patches of native grasses shrubs and areas of bare earth (10%). **Habitat bioassessment score**: 79, good condition		

Site	Feature	Upstream	Downstream
AB8	**Watercourse:** Downstream Callide Creek/ Callide Weir **Local landuse:** Native vegetation and wetland area with grazing and farm infrastructure. **Bed erosion and sedimentation**: 5-30% of the bed affected by deposition of silt within the pool. **Banks:** Convex shaped, steep (60-80°, left) left bank and convex low (10-30°) right bank. Banks moderately stable. Infrequent, small areas of erosion (5%, right bank), 95% of the streambank surface covered by vegetation. **Bed substrate:** Dominated by pebble (60%) with some cobble (20%) and small, equal presence of gravel (10%) and silt/clay (10%). Moderate compaction of bed material – array of sizes, some packing with little overlap and can be dislodged. **Macrohabitat:** Entirely rocky pool **Microhabitat**: Presence of undercut banks (15%) and some presence of detritus (10%) with equally presence of SWD and LWD (5%). Copious amounts of filamentous algae (80%) within the pool (50%) and edge (50%). Dense and diverse assemblage of macrophytes both within the pool (50%) and edge (50%). **Riparian vegetation:** Cleared patches of trees (70% left, 30% right) amongst exotic pasture grasses (25%) and native grasses (5% left, 40% right) and shrubs (7.5%). **Habitat bioassessment score**: 97, good condition		

3.2 WATER QUALITY

In-situ physiochemical data was provided by CS Energy and is tabulated in Appendix C. Samples were collected below the surface (approximately 0.5 m depth). No water quality data was provided for site AB6. Data was compared between sites and against relevant sub-regional guideline values (DEHP, 2011) for relevant habitat types (i.e., watercourse or lake). Note that this data was provided for background/general consideration and not part of Hydrobiology's scope.

Due to absence of an existing WQO for electrical conductivity (EC) in freshwater lakes and reservoirs, EC levels were compared to the Fitzroy Basin conductivity guideline value published by Prasad et al (2012) of 2000 µS/cm. This represents a toxicity trigger for the protection of 95% of species, consistent with the moderately disturbed management classification detailed in DEHP (2011).

The following observations were made:

- The dissolved oxygen (DO) (% saturation) of all sites fell below the relevant WQO except at AB5 where no oxygen saturation data was available (Figure 3-8). The low oxygen saturation can largely be attributed to an absence of flow at all sites and abundant algal growth at the downstream Callide Creek sites;
- The EC of site AB4 was 2,631 µS/cm, exceeding the relevant WQO (Figure 3-9). It is worth noting that WQO are not indicative of toxicity, however the EC of site AB4 also exceeded the the Fitzroy Basin conductivity guideline value published by Prasad et al (2012) of 2,000 µS/cm which represents a toxicity trigger for the protection of 95% of species. All other sites remained below the Callide Creek WQO and Fitzroy Basin conductivity guideline values; and
- pH levels at all downstream Callide Creek test sites with available data were within the range of WQO values (Figure 3-7). The pH levels within the test and reference lake sites were higher than the WQO but similar to each other. The pH levels upstream of the dam at control site AB1 were also higher than the WQO and similar to levels within the Dam.

It is worth noting that data provided was collected up to seven months prior to the Hydrobiology field survey, therefore the water quality results displayed below may have differed from actual conditions during sampling.

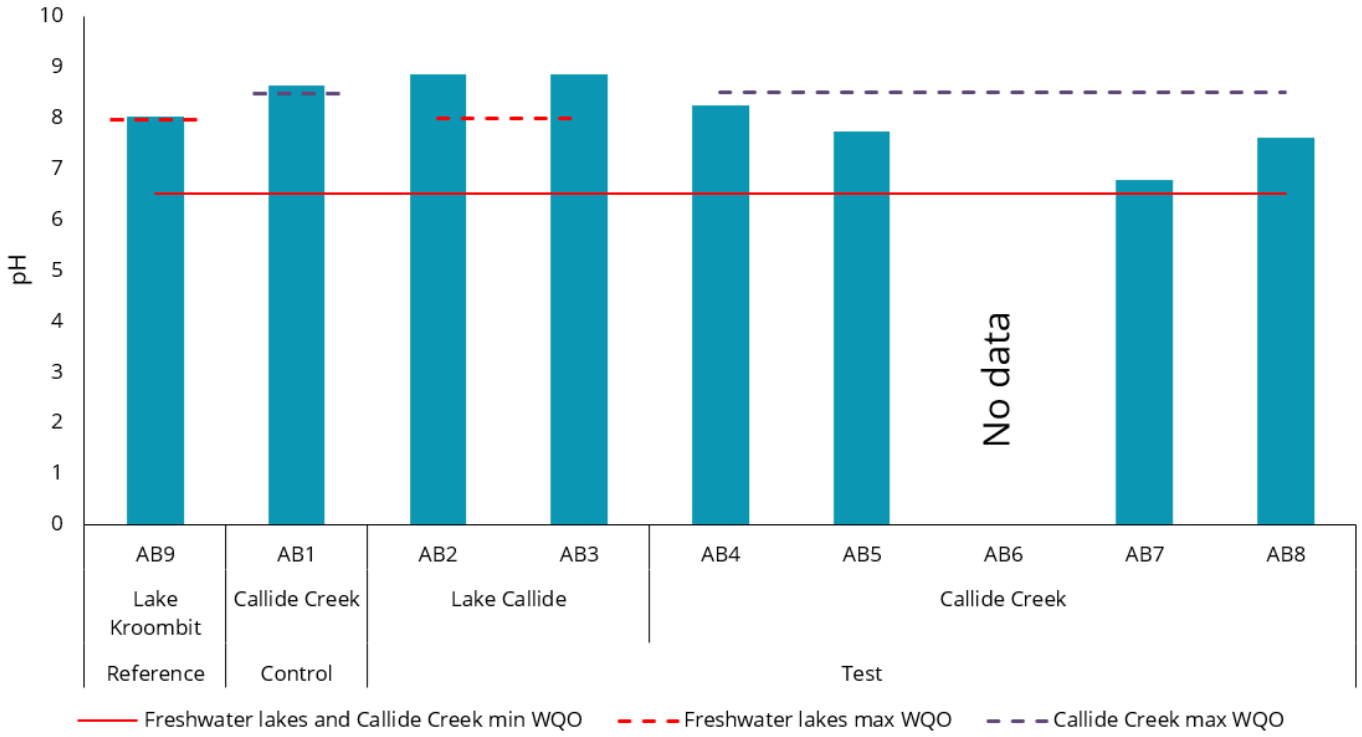


Figure 3-7 pH levels at study sites with dotted lines indicating WQO maximums and straight lines indicating WQO minimums.

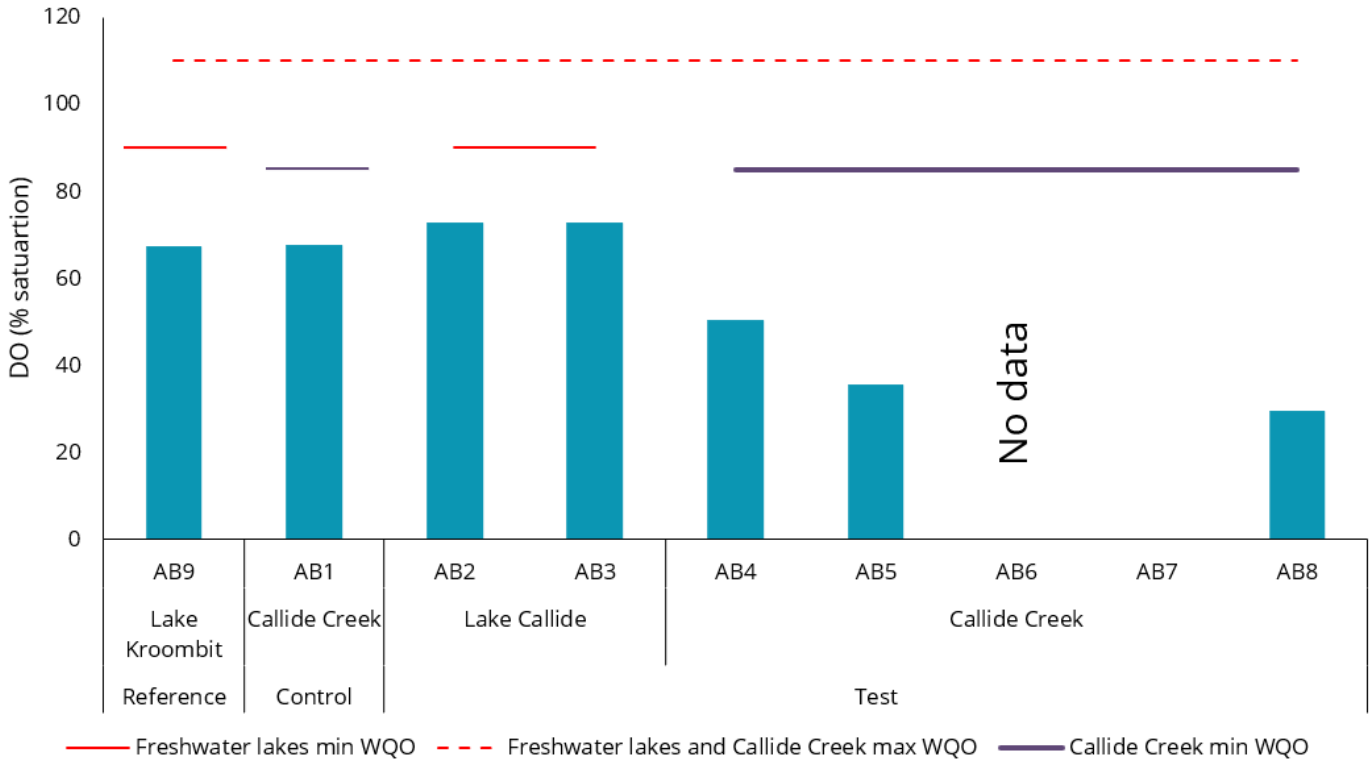


Figure 3-8 Dissolved oxygen (% saturation) levels at study sites with dotted lines indicating WQO maximums and straight lines indicating WQO minimums.

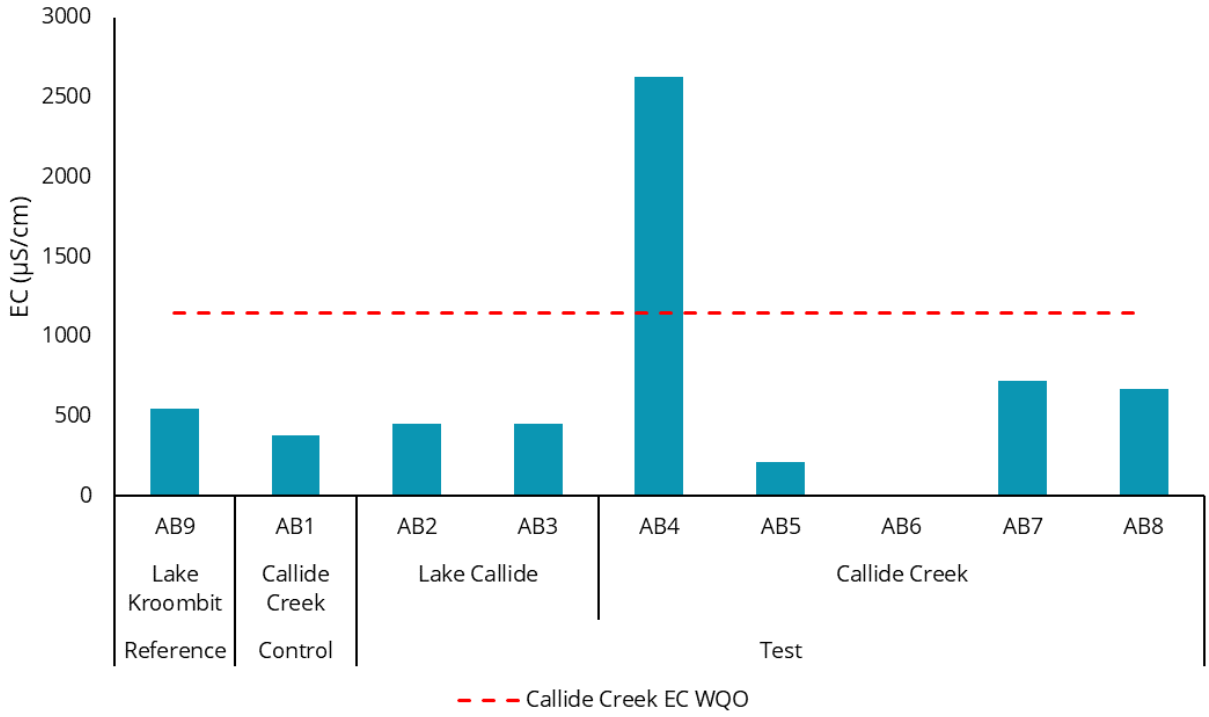


Figure 3-9 Electrical conductivity (EC, µS/cm) levels at study sites with dotted lines indicating maximum EC defined under the Callide Creek catchment WQOs. WQO only applicable for water courses, therefore not applicable to sites AB2, AB3 and AB9.

3.3 MACROINVERTEBRATES

Analysis and interpretation of diversity indices, community assemblages, AUSRIVAS modelling and functional feeding guides of all sites which contained sampleable habitat (i.e. present water) are explored below.

3.3.1 DIVERSITY INDICES

Biological quality objectives (BQOs) are defined by DEHP (2011) for Callide Creek catchment watercourses, with no BQOs defined for lacustrine habitats such as those at site AB2, AB3 and AB9. While no BQOs have been set for lacustrine habitats, sites AB2, AB3 and AB9 were included for comparison purposes.

BED

Macroinvertebrate communities were similar between habitat types (watercourse compared to lacustrine sites) and reference and non-reference sites however varied slightly between test and control sites. Overall, most sites failed to meet the defined BQO's. The following observations were made:

- No BQO has been defined for macroinvertebrate abundances. However, abundances were notably higher at reference site AB9 than any other site and there was no discernible difference between test and control sites (Figure 3-10);
- All sites fell below the BQO for taxa richness (Figure 3-11);
- Plecoptera, Ephemoptera and Trichoptera (PET) Richness BQOs were met only by control site AB1 and Lake Callide test sites AB2 and AB3. With the exception of reference site AB9, no other site recorded any PET taxa (Figure 3-12);

- Test sites AB2 and AB8 were the only sites to fall within the BQO SIGNAL2 range. Control site AB1 and test site AB4 both recorded SIGNAL2 scores that exceeded the BQO, meaning they contained higher than expected sensitive taxa. All other sites fell below the defined BQO for SIGNAL2 scores (Figure 3-13); and;
- Test sites AB2, AB3 and AB4 were the only sites to not exceed the maximum value of the BQO for % tolerant taxa BQO (Figure 3-14).

With bed habitats, test sites typically contained more tolerant taxa and few sensitive taxa in comparison to the control site. This difference is attributed to the increased substrate and habitat complexity available at AB1 in comparison to test sites downstream of Callide Dam where siltation has reduced interstitial space.

EDGE

The macroinvertebrate biodiversity indices results of control site AB1 and the Lacustrine sites AB9 (reference), AB2 (test) and AB3 (test) were similar to one another and consistently better than those recorded by test sites downstream of Callide Dam. In regard to the BQO's, the following observations were made:

- No BQO has been defined for macroinvertebrate abundances. However, abundances were notably higher at reference site AB9 than any other site and there was no discernible difference between test and control sites (Figure 3-10);
- All sites except test site AB6 fell below the BQO for taxa richness (Figure 3-11);
- PET Richness BQOs were met only by the reference site AB9 and test site AB2. All other sites fell below the BQO. PET richness, like SIGNAL2 score, is a measure of sensitive taxa present within the system, therefore it is unsurprising that the results are similar between BQOs (Figure 3-12);
- Reference site AB9 and test site AB2 were the only sites to meet the BQO for SIGNAL2 score. All other sites fell below the BQO, however sites downstream of Callide dam were consistently below other sites (Figure 3-13); and
- Control site AB1 and test sites AB2 and AB3 were the only sites to meet or fall below the % tolerant taxa BQO. All other sites exceeded the BQO for % tolerant taxa (Figure 3-14).

SUMMARY

Overall, the results would suggest that the macroinvertebrate community of downstream of lake Callide (test sites AB4 to AB8), were typically dominated by tolerant taxa when compared to the upstream control site AB1 and Lacustrine sites AB9 (reference), AB2 (test) and AB3 (test). This improved community of the control and lacustrine sites is expected to be a result of water permanence at these sites, the increased macro and microhabitat availability and reduced frequency of disturbances in comparison to the somewhat ephemeral nature of downstream Callide Creek. It is worth noting that riffles and runs were understandably absent at lacustrine sites, theoretically reducing available habitat. However, these sites contained Ephemeroptera species, which are known to inhabit lakes and reservoirs in sheltered areas such as those that were sampled.

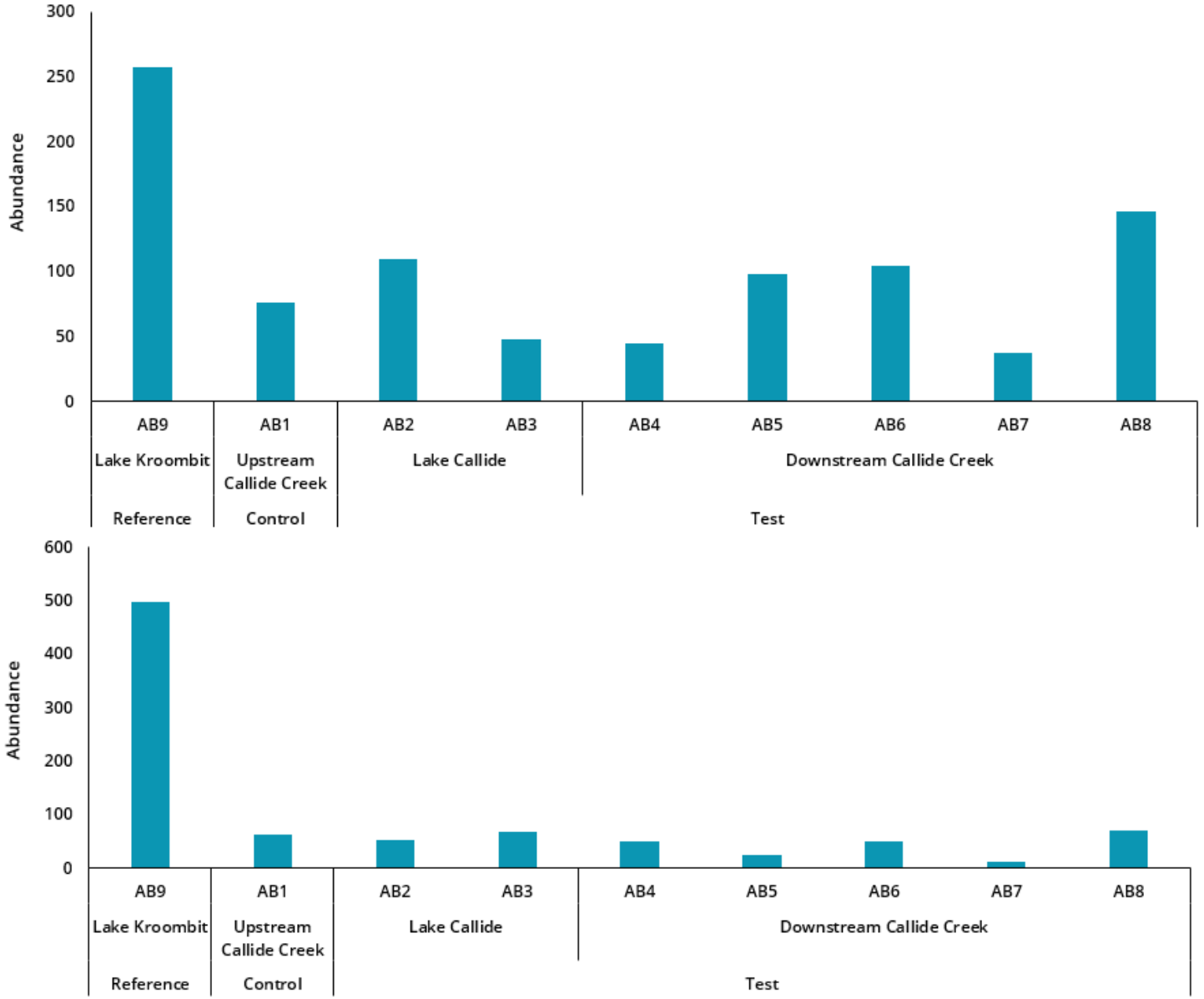


Figure 3-10 Macroinvertebrate abundance at edge habitats (top) and bed habitats (bottom)

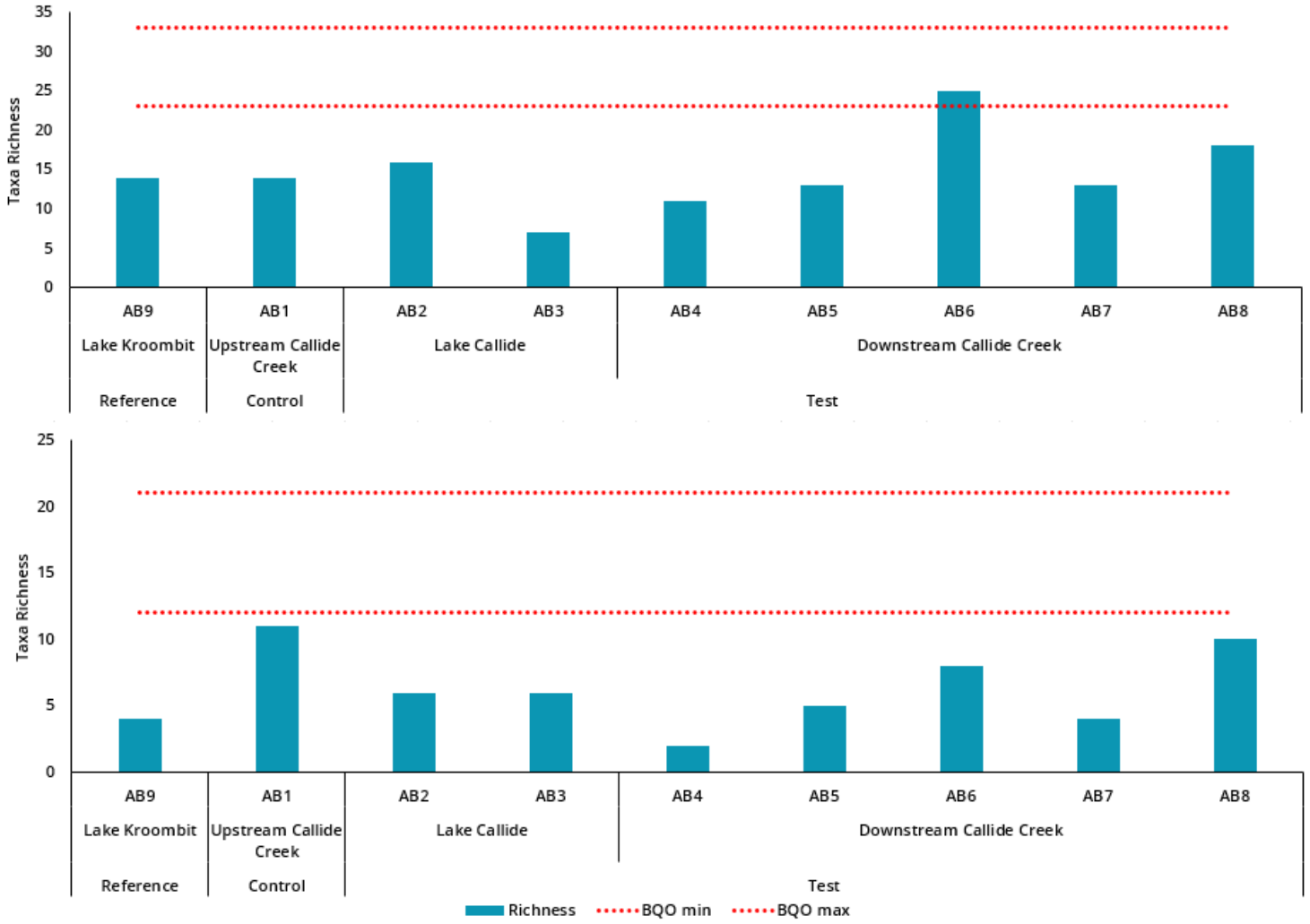


Figure 3-11 Macroinvertebrate taxa richness at edge habitats (top) and bed habitats (bottom).

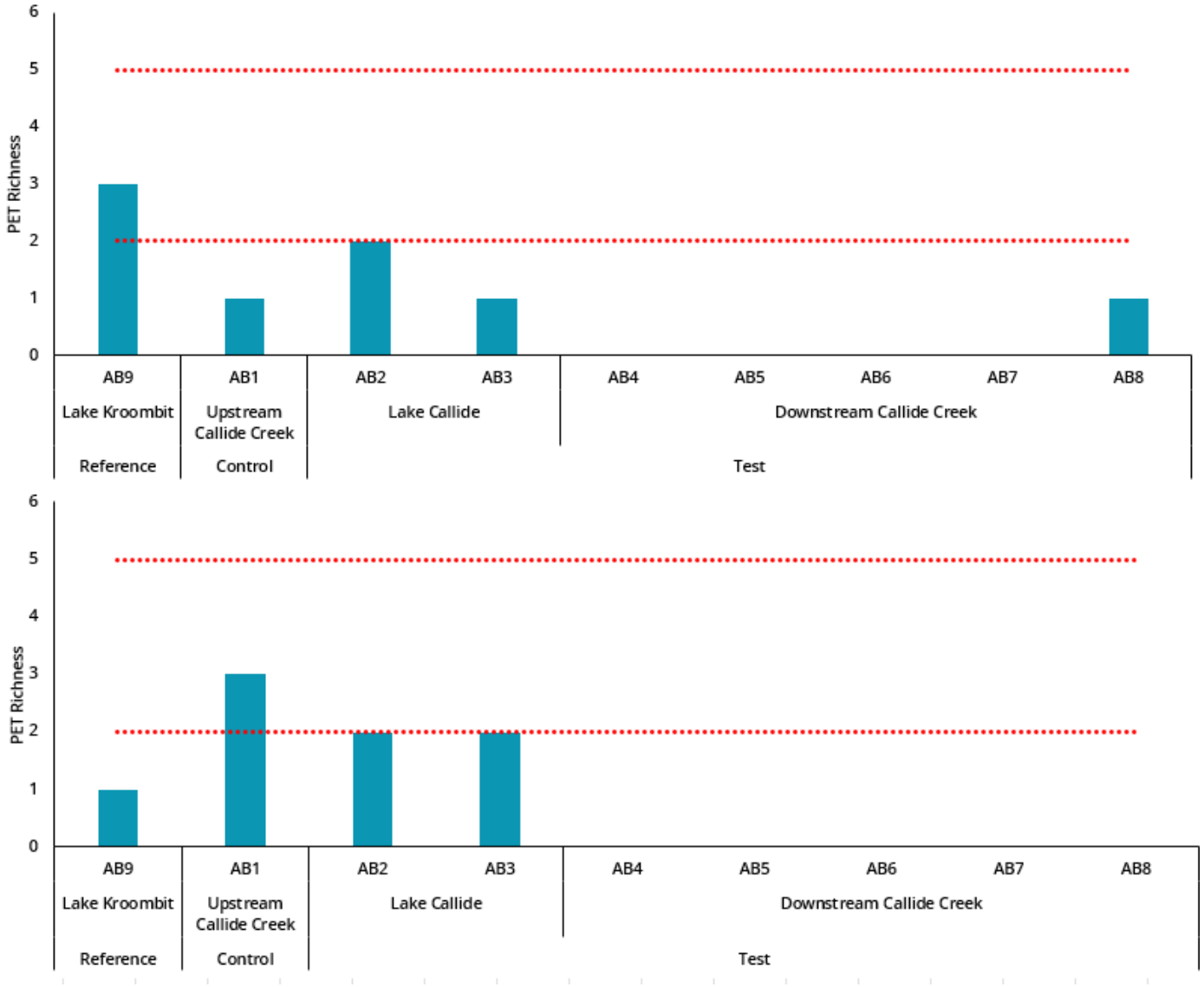


Figure 3-12 Macroinvertebrate PET taxa richness at edge habitats (top) and bed habitats (bottom).

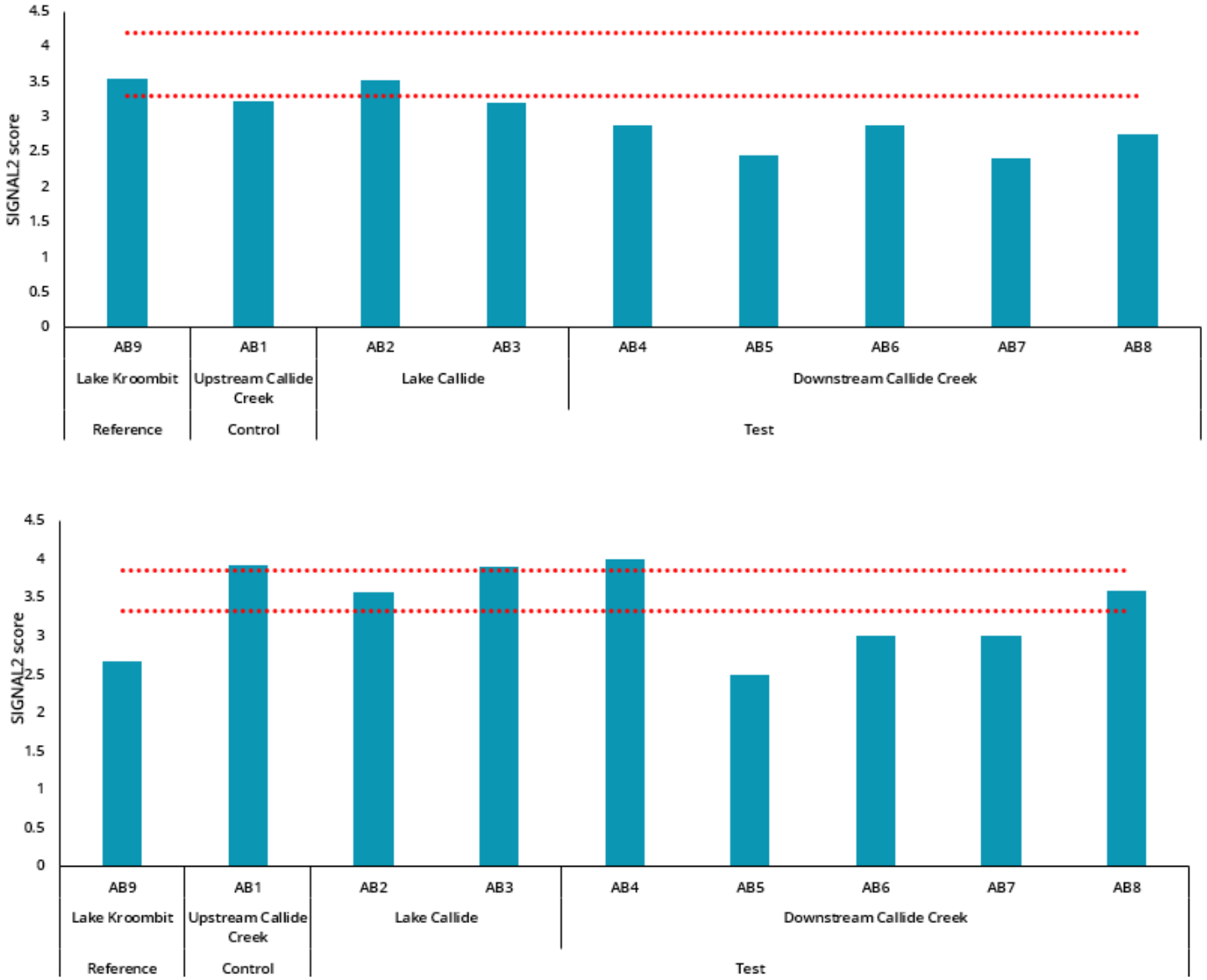


Figure 3-13 Macroinvertebrate SIGNAL2 score at edge habitats (top) and bed habitats (bottom

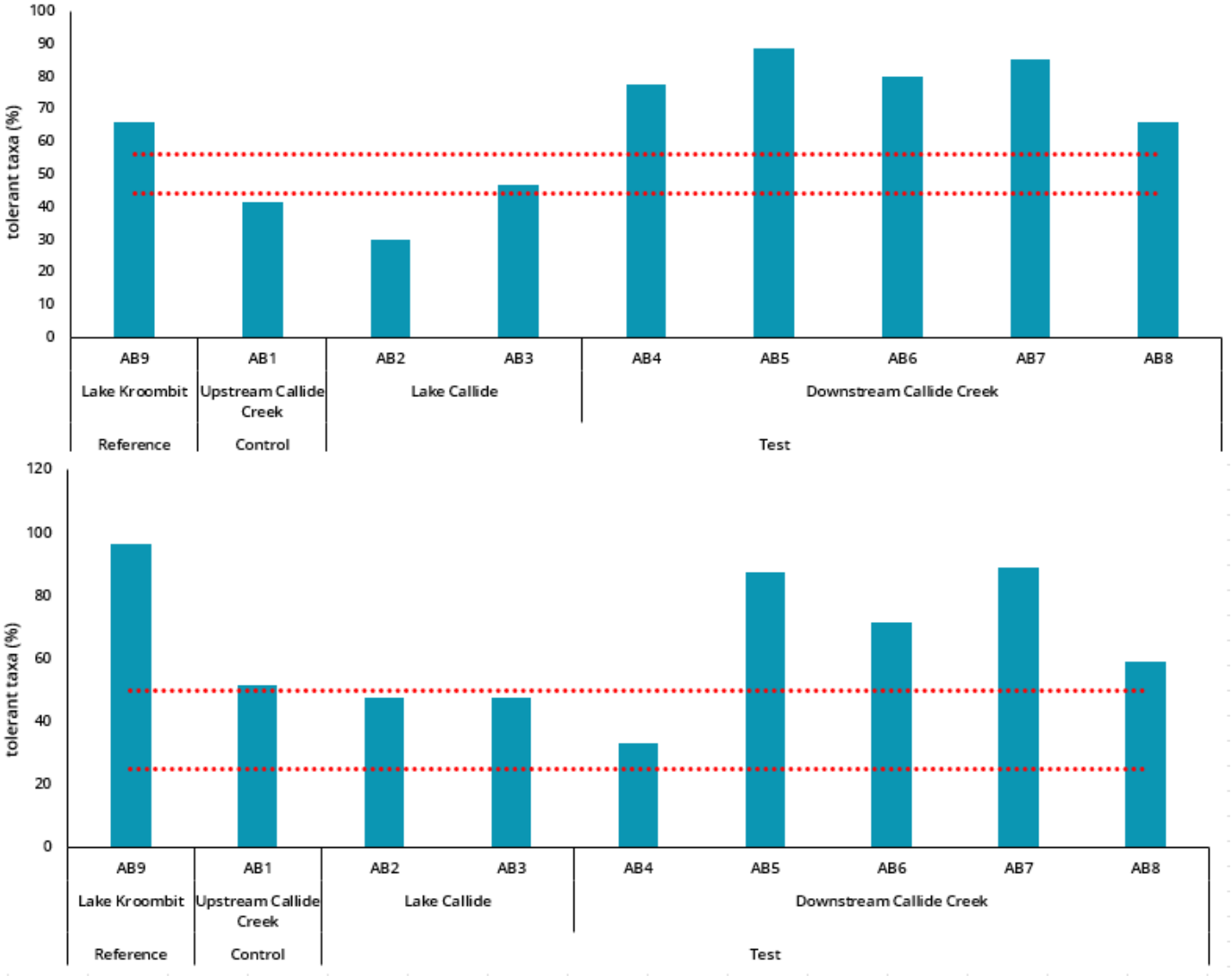


Figure 3-14 Macroinvertebrate percentage contribution of tolerant taxa at edge habitats (top) and bed habitats (bottom).

3.3.2 COMMUNITY ASSEMBLAGE

Within edge habitats, the taxa present at the greatest number of sites were Copepoda, Ostracoda, Acarina and Atyidae; however their abundances varied between test and control sites. Overall, there were no taxa that were dominant across all sites. The macroinvertebrate assemblages found within edge habitats at downstream Callide Creek sites had greater taxa evenness than the upstream Callide Creek site and the wetland sites which were dominated by one or two taxa. Cladocera were present in high numbers within the Lake Kroombit reference site but did not contribute considerably to the Lake Callide assemblages. Instead within Lake Callide site AB3, Ostracods, a different taxon of microcrustacean dominated. Another notable difference was the contribution of the family Caenidae to the Lake Callide sites AB2 (22%) and AB3 (15%) compared to their absence within Lake Kroombit. Upstream Callide Creek the family Acarina dominated the control site and was present in test site assemblages to a lesser degree. Acarina within the edge habitat of AB1 were present in high abundances due to the availability of shelter in the form of interstitial spaces as a result of reduced embeddedness, debris and macrophytes. Downstream instead contained greater abundances and a higher taxa diversity of beetles (Coleoptera) and bugs (Hemiptera). For example, as well as the families present at the control site AB1 the Coleoptera families Hydraenidae, Hydrophilidae, Hydrochidae and Hemiptera families Pleidae, Hebridae, Belostomatidae were considerable contributors to multiple test sites.

In comparison to communities found within the edge habitats, the macroinvertebrate communities within bed habitats were limited at all sites. The most widespread taxa (i.e. present at highest number of sites) within bed habitats were Copepoda and Ostracoda and these two taxa dominated most sites. Sites AB9 and AB4 showed lower diversity than other sites and were dominated by microcrustaceans (i.e. Cladocera, Copepoda and Ostracoda). Cladocera and Ostracoda species are most commonly found in sites similar to AB9 and AB4 where there is still to slow flowing waters with macrophytes and algae present. Sites AB1, AB2 and AB8 had higher taxa diversity and had greater abundances of Copepoda. Also indicative of deeper water, copepods were present in more sheltered aquatic habitats. Sites AB9 and AB3 which also had deeper pools were more exposed than sites where copepods dominated. Sites AB5, AB6, AB7 had moderate diversity and taxa evenness as copepod dominance was absent (AB5 and AB7) or reduced.

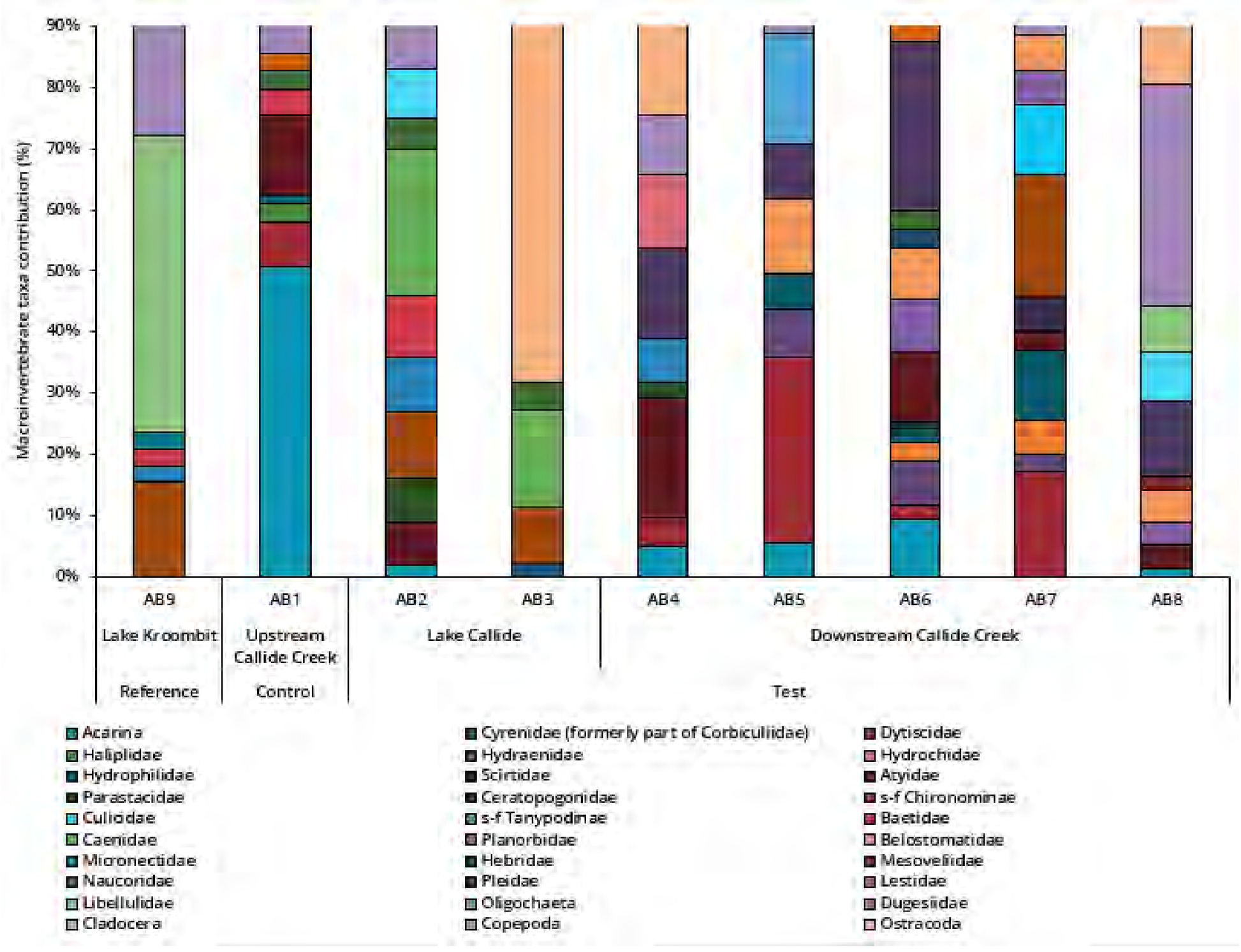


Figure 3-15 Contribution to overall macroinvertebrate assemblage from dominant taxa (dominant 90%) within edge habitat

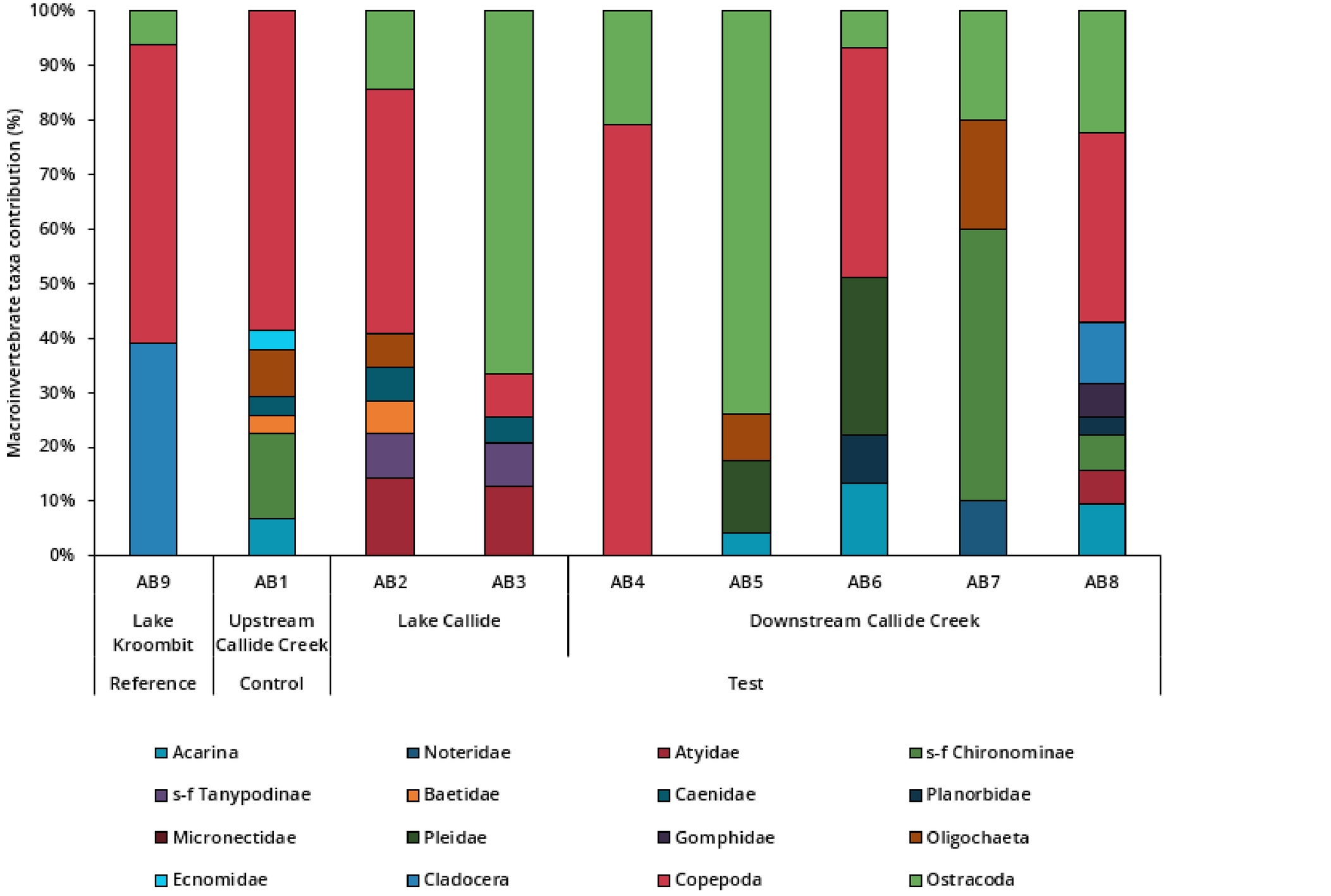


Figure 3-16 Contribution to overall macroinvertebrate assemblage from dominant taxa (dominant 90%) within bed habitat

3.3.3 FUNCTIONAL FEEDING GUIDES

Macroinvertebrate communities are often divided into functional feeding groups (FFGs) for analysis as a diverse range of taxa can be represented by a small number of FFGs which are typically indicative of food availability within a system and, more broadly, the inputs and disturbances of the system as a whole. Common divisions include filtering collectors, gathering collectors, predators, scrapers and shredders.

BED

Filtering and gathering collectors represented the majority of the macroinvertebrates present within the bed habitats of most sites. Collectors (filtering and gathering) contributed 44-90% of the total macroinvertebrate assemblage of sites, dominating at reference site AB9 and test site AB4. All other sites contained a more diverse assemblage of FFGs, with predators, scavengers, scrapers and macrophyte piercers representing small contributions to the remaining sites. There were no clear distinctions between test and control sites.

Collectors are often dominant in environments where fine particulate organic matter (FPOM) is far more abundant than coarse particulate matter, due to increased input from upstream due to biological (shredder) and mechanical processes, and autochthonous primary production. Within the surveyed sites, the macroinvertebrate assemblage within Lake Callide contained more FFG than Lake Kroombit, likely due to higher woody debris and detritus in the microhabitat of Lake Callide in comparison to periphyton.

EDGE

In comparison to bed habitats, the FFGs present within the edge habitat were more diverse and there were some notable variations in FFGs between sites, however no clear distinction between treatments.

Within edge habitats, sites were largely dominated by predators, however collectors were also present as were scrapers, shredders and parasites. Predators and parasites represented at least 50% of the macroinvertebrate assemblage present within the edge habitats of all sites except AB8, with the remaining macroinvertebrates typically collectors. The edge community at site AB8 had higher levels of filtering collectors, namely copepods. Predators are a highly diverse FFG, and typically represent a stable contribution to the macroinvertebrate taxa, however overabundance can be indicative of disturbed systems.

Predators typically represent a stable contribution to the macroinvertebrate taxa but are usually classified as over-abundant when the predator: prey ratio exceeds 0.2, and usually represent <45% of the overall assemblage(Kaboré et al., 2016; Masese et al., 2014; Rai et al., 2019; Sitati et al., 2021). Some suggested reasons for domination by predator taxa have included prey communities able to support large predator abundances (short life history traits) and seasonality of prey availability within the overall community; however high predator abundances are often linked to disturbances, poor water quality and surrounding land use(Carrasco-Badajoz et al., 2022; Edegbene & Akamagwuna, 2022; Miserendino & Masi, 2010; Rai et al., 2019; Sitati et al., 2021). The dominance of predators within the edge habitats of most sites would suggest that these sites are highly disturbed with poor water and/or habitat quality, which is consistent with the noted lower than expected diversity and abundance of tolerant taxa, particularly downstream of Lake Callide.

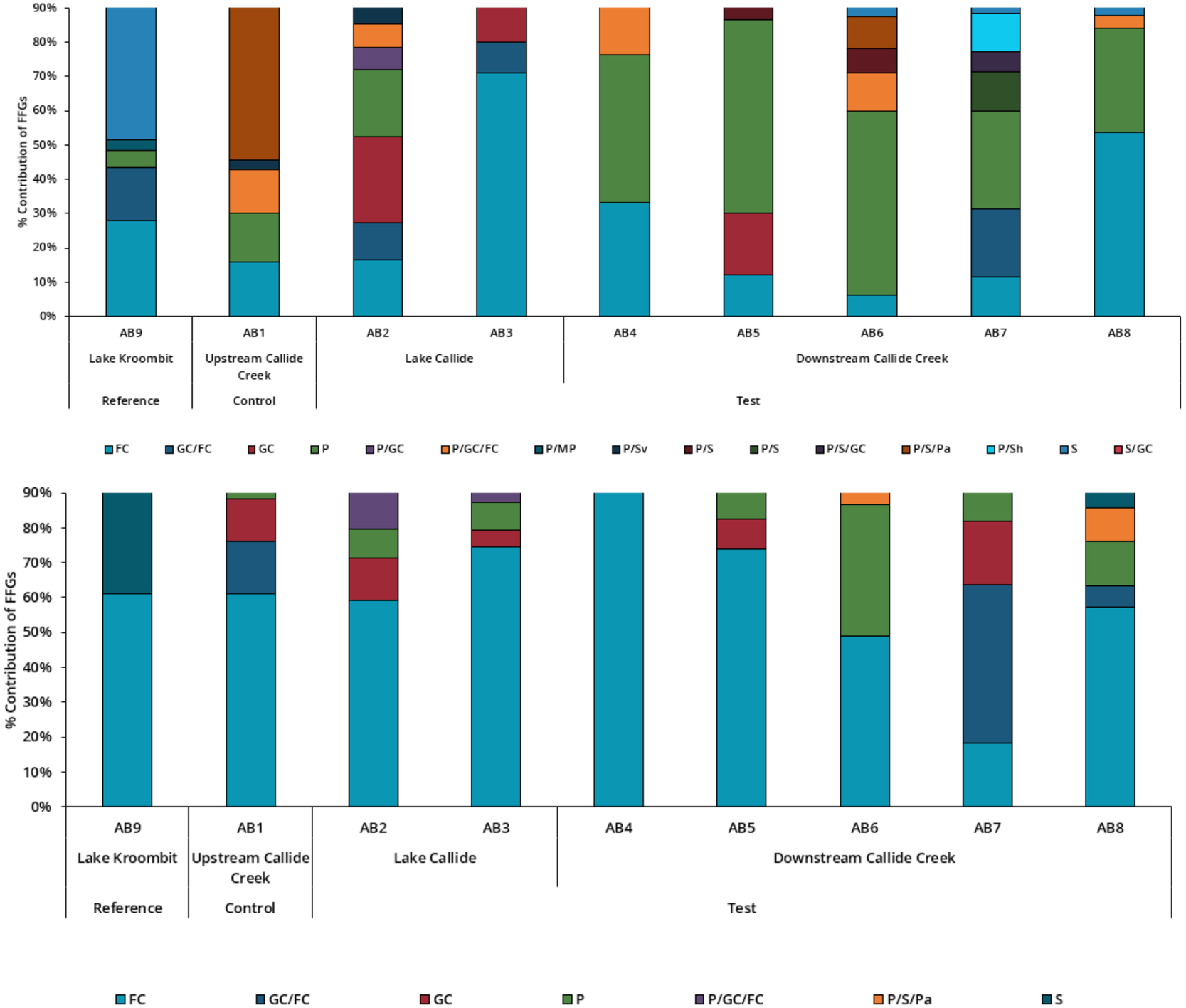


Figure 3-17 Functional Feeding Guides (FFGs) of macroinvertebrate taxa (high contributing species -90%) within edge (top) and bed (bottom) habitats. FFGS present in the study included filtering collectors (FC), gathering/filtering collectors (GC/FC), gathering collectors (GC), predators (P), predators/gat5hering collectors (P/GC), predators/gathering collectors/filtering collectors (P/GC/FC), predators/macrophyte piercers (P/MP), predators/scavengers (P/Sv), predators/ scrapers (P/S), predators/scrapers/gathering collectors (P/S/GC), predators/scrapers/parasites (P/S/PA), predators/shredders (P/Sh), scrapers (S), scrapers/gathering collectors (S/GC).

3.3.4 AUSRIVAS MODELLING

Within edge habitats all sites were in significantly impaired condition including the control site. Within bed habitats the control site recorded better than reference condition and site AB8 the furthest downstream recorded reference condition bed habitat. Sites more directly downstream of Lake Callide such as AB4, AB6, and AB7 all had significantly impaired bed habitat and downstream site AB5 had severely impaired bed habitat. As mentioned previously, the habitat condition of site AB1 was superior to the condition of the downstream Callide Creek sites due to higher variability in the substrate and microhabitat.

Table 3-2 OE50 scores from the March 2023 data. Bands are indicated in brackets and by cell colour; dark green (X) = more biologically diverse than reference site; light green (A) = reference condition; yellow (B) = significantly impaired; orange (C) = severely impaired; red (D) = extremely impaired.

Site	OE50 Edge scores	OE50 Bed Scores
Control – Upstream Callide Creek		
AB1	0.72(B)	0.96(X)
Test – Downstream Callide Creek(B)		
AB4	0.88(B)	1.06(B)
AB5	0.85(B)	0.78(C)
AB6	0.83(B)	0.97(B)
AB7	0.72(B)	0.77(B)
AB8	0.86(B)	0.9(A)

3.4 FISH, MACROCRUSTACEANS, AND REPTILES

Diversity, community assemblages and recruitment and biomass of all aquatic species caught at sites during the survey event are explored below.

3.4.1 FISH

WQO COMPARISSON

Ratio of Observed to Expected native species (O/E50) and exotic fish species WQO values were defined by DEHP (2011) for sites along the main trunk of Callide Creek only. This meant that data from site AB9 could not be used as it was located in a different catchment (Kroombit Creek). Overall, control sites scored better than test sites, but sites were typically less diverse than expected.

Control site AB1 was the only site along the main trunk of Callide Creek that met the WQO for O/E50 values (Table 3-3). All test sites fell below the O/E50, meaning that they contained fewer native taxa that would be expected in. All sites except control site AB1 and test site AB3 contained *Gambusia holbrooki*. The species has been recorded within Callide Creek main trunk before and is listed within the defined WQO. However, as no site recorded non-native species not listed within the WQOs or more than two non-native species, all sites met the WQO for alien taxa.

Table 3-3 Comparison of Callide Creek main trunk fish WQOs to observed fish diversity indices of each assessed reach. Highlighted values indicate non-conformance with the defined biological WQO.

Site	Treatment	O/E50	Alien Taxa
AB1	Control	1	0
AB2	Test	0.7857	1
AB3	Test	0.5714	0
AB4	Test	0.5714	1
AB5	Test	0.2143	1
AB6	Test	0	1
AB7	Test	0.3571	1
AB8	Test	0.8571	1

DIVERSITY

Across the study area a total of 3,863 individuals representing 19 taxa were recorded in varying abundances across sites (Figure 3-18; Table 3-4). Species recorded in higher abundances included bony bream (*Nematalosa erebi,* n=1032), fly-specked hardyhead (*Craterocephalus stercusmuscarum,* n=955), Agassizii's glassfish (*Ambassis agassizii,* n= 513), and barred grunter (*Amniataba percoides,* n = 501). Agassizii's glassfish was additionally the most abundant species occurring at all but one site (AB6). Other widespread taxa included fly-speckled hardyhead (n=6), mosquitofish (*Gambusia holbrooki*, n= 6), and carp gudgeon (*Hypseleotris sp.,* n=6). Conversely, the larger-bodied southern saratoga was only represented by one individual recorded in the deepest waterbody; Lake Callide site AB2.

AB1 (14 taxa) had the highest taxa richness across the surveyed sites followed by downstream Callide Creek site AB8 (13 taxa). Downstream of Lake Callide sites AB5, AB6 and AB7 had the lowest taxa richness and fish abundance. Taxa that prevailed at these less diverse sites included Agassizi's glassfish, mosquitofish (*Gambusia holbrooki*), and southern purplespotted gudgeon (*Mogurnda adspersa*). Sites AB5, AB6 and AB7 consisted of small, shallow pools dense with macrophytes and therefore there was limited available macrohabitat and food sources available for a wider range of species. In Callide Creek taxa exclusively recorded in the upstream site AB1 and the downstream site AB8 included golden perch (*Macquira ambigua),* barred grunter (*Amniataba percoides),* spangled perch (*Leiopotherapon unicolor),* bony bream *(Nematalosa erebi),* Hyrtl's catfish *(Neosilurus hyrtlii)* and freshwater longtom *(Strongylura krefftii).* The presence of these species is likely attributed to more diverse macrohabitats and microhabitats. These larger bodied taxa, most of which are carnivores or omnivores need larger areas and greater access to suitable food sources to meet their reproductive and survival needs. Therefore AB1 and AB8 as larger, more connected, more diverse aquatic habitats are more likely to support these species.

Fish abundance was greatest within Lake Callide at site AB3 (n=1515), followed by AB2 (n=1010) and greatly exceeded the reference site AB9 at Lake Kroombit (n=202). The smaller Lake Kroombit was less diverse than the test sites in Lake Callide as only six taxa were recorded at AB9 whereas in

comparison 13 taxa were recorded across sites AB2 and AB3. Taxa recorded in both lakes included Agassizii's glassfish, carp gudgeon, Hyrtl's catfish and freshwater catfish (*Tandanus tandanus*). Species absent from the test sites that were present in the reference included spangled perch (*Leiopotherapon unicolor*) and eastern rainbowfish (*Melanotaenia splendida*). Overall, the larger Lake Callide supported more individuals and taxa as predicted.

EXOTIC SPECIES

Sites AB5 and AB6 were dominated by the exotic species mosquitofish (*Gambusia holbrooki,* n=107) which were also present at sites AB2, AB4, AB7 and AB8. Mosquitofish were present in low numbers (n=2) in Lake Callide and were not recorded in Lake Kroombit nor upstream at site AB1.

COMMUNITY ASSEMBLAGES

Typically, downstream creek site assemblages were dominated by small-bodied fish with site AB8 additionally supporting medium bodied species such as spangled perch (*Leiopotherapon unicolor*) and bony bream. Whereas upstream at Callide Creek site AB1 there was more diverse assemblage of fish and higher abundances of medium bodied fish such as bony bream and spangled perch. Within Lake Callide larger individuals such as southern saratoga (*Scleropages leichardti*) that require bigger and deeper bodies of water are a part of the system.

Species stocked by the Callide Valley Native Fish Stocking Association (CVNFSA) within Lake Callide include golden perch (*Macquaria ambigua*), barrumundi (*Lates calcarifer*), southern saratoga (*Scleropages leichardti*) and sleepy cod (*Oxyeleotris lineolata*) of which the three latter species were recorded at Lake Callide and downstream in the case of sleepy cod, in low abundances and likely represent translocated populations. One golden perch was recorded upstream of the dam wall at site AB1.

RECRUITMENT AND BIOMASS OF FISH

Variation in fish length suggests the presence of several different age/size classes (fingerlings, juveniles and adults) at all sites excluding AB6 where no fish were recorded (Table 3-5). Species recorded in low abundances such as *Strongylura kreffti* (freshwater longtom), golden perch and southern saratoga do not demonstrate this pattern and their sizes indicate adult individuals. These individuals may then only be present in the environment through stocking and associated dispersal and not from local populations within Lake Callide and Callide Creek. For most of the taxa present within site assemblage variation in size classes suggests successive generations and that both sites are providing suitable nesting habitat as all the species identified are potadromous (i.e. their lifecycle is completed in freshwater). The invasive mosquitofish individuals were mostly small indicating they are the result of successive generations where there a few reproductively active individuals producing many offspring that are heavily predated and/or resource limited due to their population density, leading to mortality before they reach full maturity.

The sites downstream of Callide Dam, excluding AB8 the furthest from Lake Callide, were populated by relatively small fish, indicating that present habitat may not be sufficient to support larger fish species. However, these sites may still serve as nursery habitats for fish before they move into areas with deeper pools like those provided at site A8 to mature. The availability of suitable nesting and spawning habitat within these more degraded reaches is likely a factor that limited the presence of juveniles of other species.

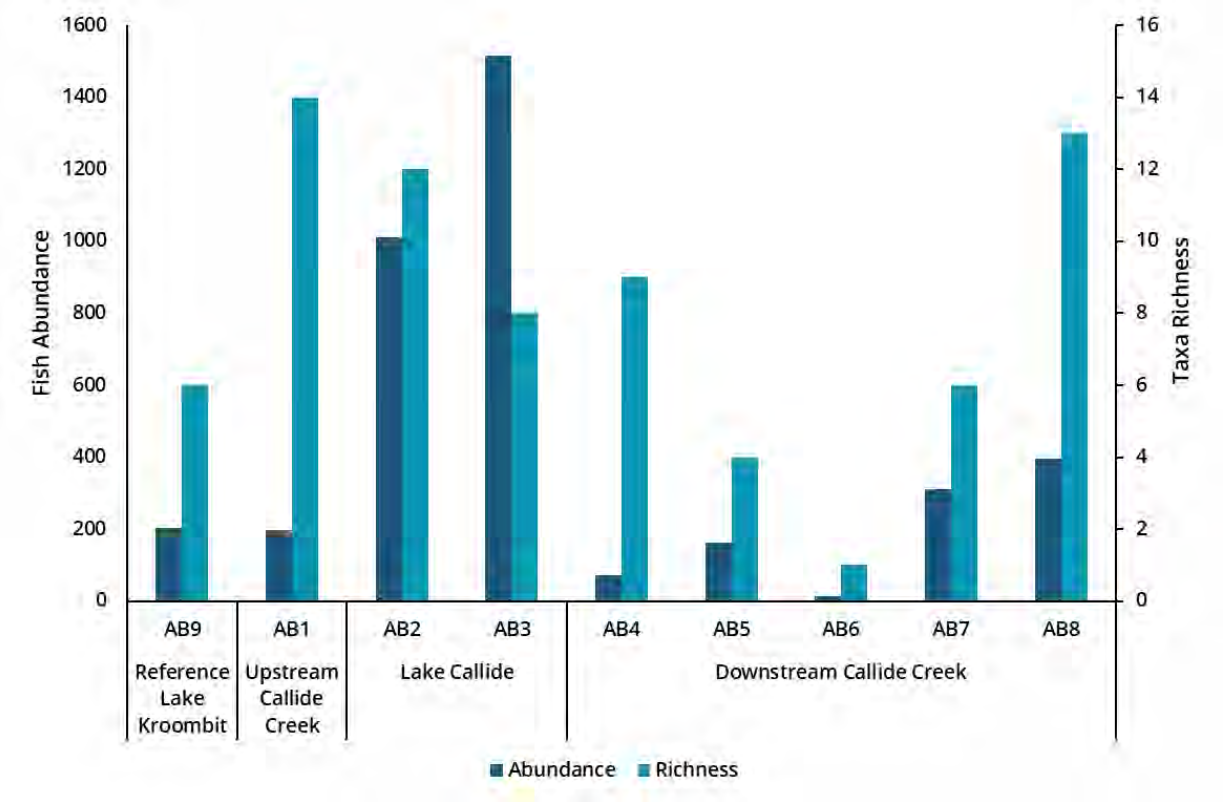


Figure 3-18 Abundance and taxa richness of fish caught at all sites.

Table 3-4 Fish captured in March 2023 survey.

Species	Common name	Reference Lake Kroombit	Upstream Callide Creek	Lake Callide		Downstream Callide Creek				
		AB9	AB1	AB2	AB3	AB4	AB5	AB6	AB7	AB8
Ambassidae										
Ambassis agassizii	Agassiz's glassfish	46	20	225	182	18	1		6	15
Anguillidae										
Anguilla reinhardtii	longfinned eel									3
Apogonidae										
Glossamia aprion	mouth almighty		7	24	19	14				1
Atherinidae										
Craterocephalus stercusmuscarum	fly-specked hardyhead		50	483	339	18			1	64
Belonidae										
Strongylura krefftii	freshwater longtom		1	3	5					
Butidae										
Oxyeleotris lineolata	sleepy cod				6	1				
Clupeidae										
Nematalosa erebi	bony bream		30	225	521					256
Eleotridae										
Hypseleotris sp.	carp gudgeon	6	6	1		2			103	6
Mogurnda adspersa	southern purplespotted gudgeon		1			10	35		20	
Latidae										
Lates calcarifer	barramundi			2	3					
Melanotaeniidae										
Melanotaenia splendida	eastern rainbowfish	50	22						117	10
Osteoglossidae										
Scleropages leichardti	southern saratoga			1						
Percichthyidae										
Macquaria ambigua	golden perch		1							1
Plotosidae										
Neosilurus hyrtlii	Hyrtl's catfish	68	26	1						15

Species	Common name	Reference Lake Kroombit	Upstream Callide Creek	Lake Callide		Downstream Callide Creek				
		AB9	AB1	AB2	AB3	AB4	AB5	AB6	AB7	AB8
Porochilus rendahli	Rendahl's catfish		1			1	18			3
Tandanus tandanus	freshwater catfish	4	1	3		1				
Poeciliidae										
Gambusia holbrooki	mosquitofish			2		6	107	13	56	2
Terapontidae										
Amniataba percoides	barred grunter		18	40	440					3
Leiopotherapon unicolor	spangled percch	28	12							17
Total		202	196	1010	1515	71	161	13	312	396
Taxa richness		6	14	12	8	9	4	1	6	13

Table 3-5 Minimum, maximum and average lengths (mm) of taxa recorded at each site.

Species	common name	Reference Lake Kroombit			Upstream Callide Creek			Lake Callide						Downstream Callide Creek												
		AB9			AB1			AB2			AB3			AB4			AB5			AB6			AB7			AB8		
		Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)		
		Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max
Ambassidae																												
Ambassis agassizii	Agassiz's glassfish	40	64	77	26	37	58	21	34	57	23	35	54	20	27	35	41	41	41	-	-	-	24	27	30	34	47	62
Anguillidae																												
Anguilla reinhardtii	longfinned eel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	540	763	1000
Apogonidae																												
Glossamia aprion	mouth almighty	-	-	-	46	93	130	37	65	112	27	59	130	22	38	94	-	-	-	-	-	-	-	-	-	124	124	124
Atherinidae																												
Craterocephalus stercusmuscarum	fly-specked hardyhead	-	-	-	26	46	71	27	42	75	16	32	78	22	28	37	-	-	-	-	-	-	26	26	26	25	46	93
Belonidae																												
Strongylura krefftii	freshwater longtom	-	-	-	257	257	257	675	735	780	255	442	546	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Species	common name	Reference Lake Kroombit			Upstream Callide Creek			Lake Callide						Downstream Callide Creek												
		AB9			AB1			AB2			AB3			AB4			AB5			AB6			AB7			AB8		
		Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)		
		Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max
Butidae																												
Oxyeleotris lineolata	sleepy cod	-	-	-	-	-	-	-	-	-	46	202	410	87	87	87	-	-	-	-	-	-	-	-	-	-	-	-
Clupeidae																												
Nematalosa erebi	bony bream	-	-	-	25	152	256	34	121	370	64	120	370	-	-	-	-	-	-	-	-	-	-	-	-	68	216	318
Eleotridae																												
Hypseleotris sp.	carp gudgeon	28	40	47	21	26	32	20	20	20	-	-	-	18	25	32	-	-	-	-	-	-	18	30	38	16	19	21
Mogurnda adspersa	southern purplespotted gudgeon	-	-	-	78	78	78	-	-	-	-	-	-	21	42	61	26	41	75	-	-	-	21	31	57	-	-	-
Latidae																												
Lates calcarifer	barramundi	-	-	-	-	-	-	880	925	970	800	852	925	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Melanotaeniidae																												
Melanotaenia splendida	eastern rainbowfish	32	64	90	43	74	97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	31	38	26	39	78
Osteoglossidae																												
Scleropages leichardti	southern saratoga	-	-	-	-	-	-	700	700	700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Percichthyidae																												
Macquaria ambigua	golden perch	-	-	-	554	554	554	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	252	252	252
Plotosidae																												
Neosilurus hyrtlii	Hyrtl's catfish	118	171	288	98	197	324	220	220	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	121	134	156
Porochilus rendahli	Rendahl's catfish	-	-	-	127	127	127	-	-	-	-	-	-	76	76	76	64	75	86	-	-	-	-	-	-	100	136	162
Tandanus tandanus	freshwater catfish	137	180	205	452	452	452	80	159	225	-	-	-	445	445	445	-	-	-	-	-	-	-	-	-	-	-	-
Poeciliidae																												

Species	common name	Reference Lake Kroombit			Upstream Callide Creek			Lake Callide						Downstream Callide Creek												
		AB9			AB1			AB2			AB3			AB4			AB5			AB6			AB7			AB8		
		Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)			Total length(mm)		
		Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max
Gambusia holbrooki	Mosquitofish*	-	-	-	-	-	-	20	21	21	-	-	-	18	26	31	18	27	38	17	27	36	21	28	36	36	39	41
Terapontidae																											
Amniataba percoides	barred grunter	-	-	-	46	87	180	26	86	135	12	86	196	-	-	-	-	-	-	-	-	-	-	-	-	92	143	174
Leiopotherapon unicolor	spangled perch	66	116	213	80	121	186	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88	132	200

*exotic

3.4.2 MACROCRUSTACEANS

Across the surveyed sites, a total of three macrocrustacean taxa were recorded with assemblages notably different upstream and downstream of Callide Dam (Figure 3-19, Table 3-6). Only freshwater shrimp (*Atyidae sp*.) were recorded downstream of Callide Dam and only at sites AB4 (n=5) and AB7 (n=20). No macrocrustaceans were recorded at AB5, AB6 and AB8 likely a result of the reduced available habitat. Upstream of the Callide Dam spillway, where more water and habitat was available at sites AB3, AB2 and AB1 macrocrustacean taxa richness was higher as two taxa were present: redclaw crayfish (*Cherax quadricarinatus*); and freshwater prawns (*Macrobrachium sp*.). Abundance of these two taxa was highest at site AB3 (n=43) followed by similarly abundant sites AB1(n=15) and AB2 (n=14). At the reference site AB9, a smaller lake than Lake Callide macrocrustacean abundance was lower (n = 9) and only freshwater prawn was recorded.

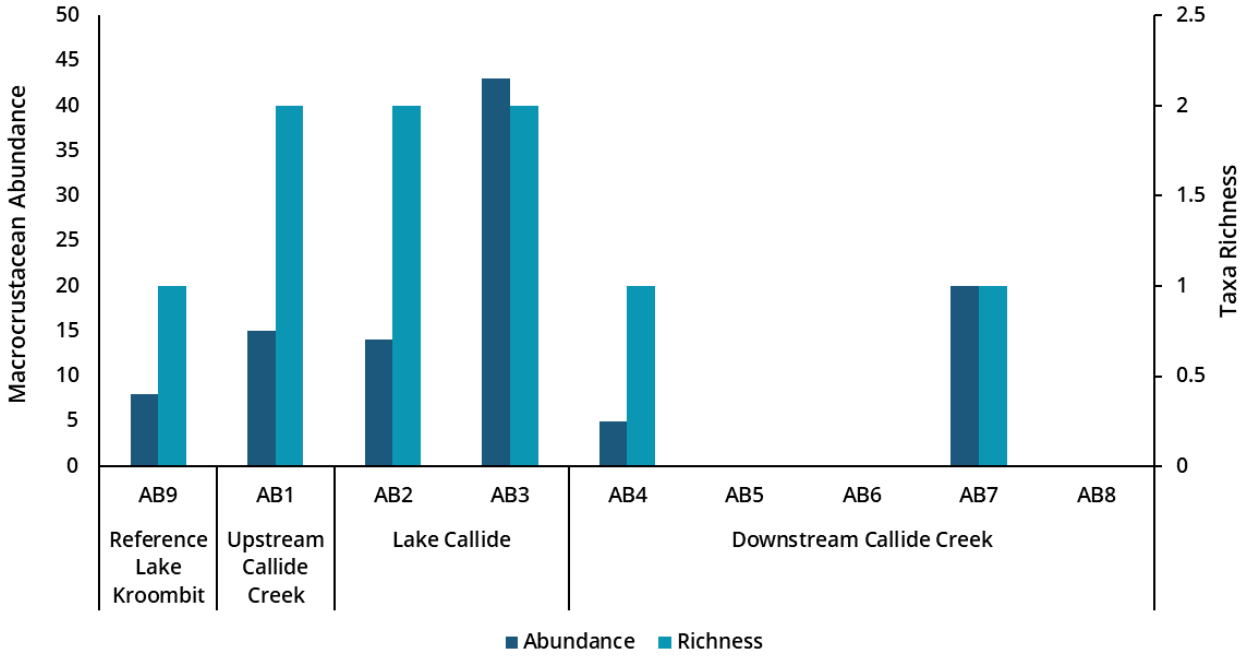


Figure 3-19 Abundance and taxa richness of macrocrustaceans caught at all sites - no macrocrustaceans were captured or observed at AB5, AB6 or AB8.

Table 3-6 Macrocrustaceans captured in March 2023 survey.

Taxa	common name	Reference	Upstream Callide Creek	Lake Callide		Downstream Callide Creek				
		AB9	AB1	AB2	AB3	AB4	AB5	AB6	AB7	AB8
Atyidae	freshwater shrimp					5			20	
Cherax quadricarinatus	redclaw crayfish		4	12	23					
Macrobrachium	freshwater prawn	8	11	2	20					
Total		8	15	14	43	5			20	

3.4.3 REPTILES

Krefft's turtle (*Emydura krefftii*) was present at all sites except for AB7 and abundant at sites AB9 (n=49), AB1 (n-40) and AB8 (n=45). The remaining four species were present at low abundances, each present across a few sites. Control site AB1 which had greater availability of microhabitats and better water quality, had the highest taxa richness with all five species recorded. Single broad-shelled river turtles were present at sites AB1, AB7 and AB8. Sawshell turtles were also recorded in low abundances at sites AB9 (n=3), AB1 (n=1) and AB8 (n=1). Eastern long-necked turtles were recorded at AB1 (n=1) and AB3 (n=2). The critically endangered White throated snapping turtle was only recorded at the most diverse site AB1 (n=1). The dissolved oxygen at this site was significantly higher than recorded at the downstream sites and more conducive to turtle physiology (i.e. cloacal breathing). Habitats downstream are also likely limited in the number of turtles they can support due to the size of the waterbodies and the abundance of microhabitats and food. The infrastructure of the Dam may create barriers to dispersal of turtles, especially when population numbers are low, as in the case of the white-throated snapping turtle.

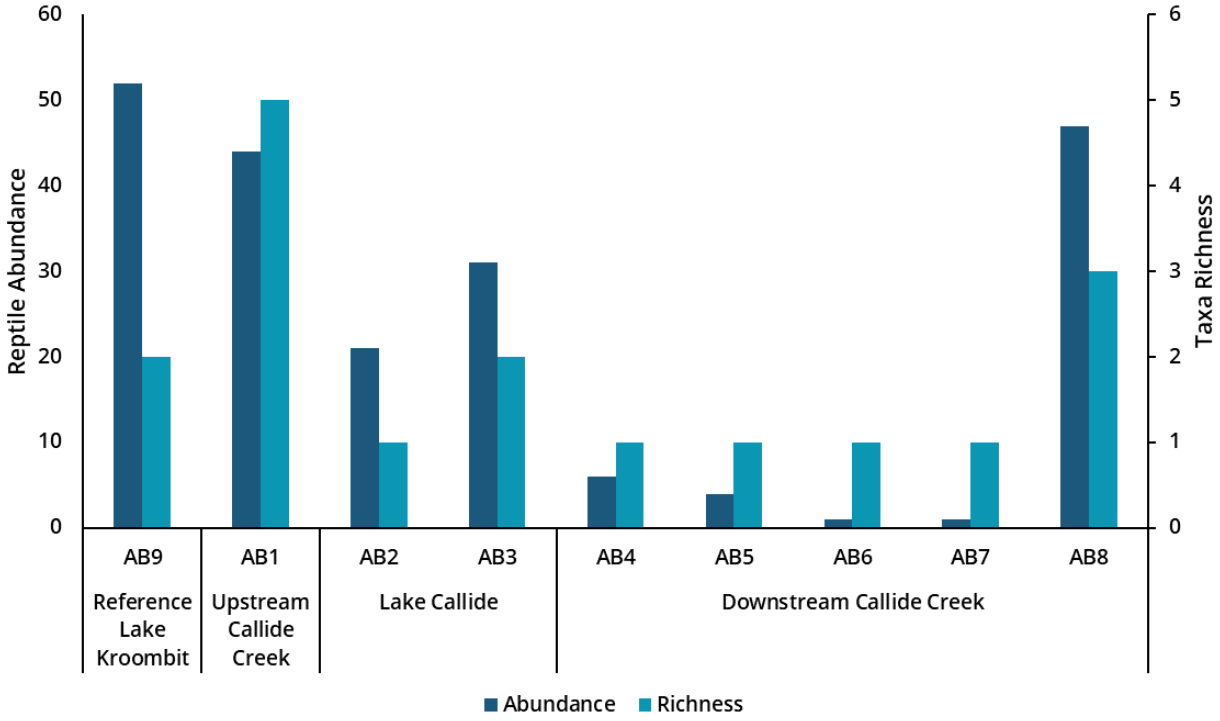


Figure 3-20 Abundance and taxa richness of reptiles caught at all sites - no reptiles were captured or observed at AB14.

Table 3-7 Aquatic reptiles captured in March 2023 survey.

Species	common name	Reference Lake Kroombit	Upstream Callide Creek	Lake Callide		Downstream Callide Creek				
		AB9	AB1	AB2	AB3	AB4	AB5	AB6	AB7	AB8
Chelidae										
Chelodina expansa	broad-shelled river turtle		1						1	1
Chelodina longicollis	eastern longnecked turtle		1		2					
Elseya albagula	white-throated snapping turtle		1							
Emydura krefftii	Krefft's river turtle	49	40	21	29	6	4	1		45
Myuchelys latisternum	sawshelled turtle	3	1							1
Total		52	44	21	31	6	4	1	1	47

3.5 BIOTA TISSUE ANALYSIS

3.5.1 PFAS

The target human and ecological health species were chosen based on the Sampling Analysis and Quality Plan (SAQP) (Epic Environmental, 2022). The human and ecological health target biota caught and subsequently analysed are displayed in Table 3-8.

HUMAN HEALTH TARGET SPECIES

To inform the human health risk assessment, the target samples were edible size biota that are more commonly consumed by local residents. This provides the most representative dataset regarding risk to human health via consumption of fish.

The target freshwater species for human health assessment as designated in the SAQP (Epic Environmental, 2022) were:

- Barramundi (Lates calcarifer);
- Crayfish (*Cherax quadricarinatus*); and
- Yellowbelly (*Macquaria ambigua*).

As the target species were not well represented at all sites within in the catchment it was decided that additional human health target species should be selected. These species were those potentially eaten by humans and were selected based on local knowledge and those defined as common edible freshwater species for PFAS sampling programs (Queensland Health, no date). The additional species were:

- Eeltail catfish (*Tandanus tandanus*);
- Hyrtl's catfish (*Neosilurius hyrtlii*);
- Rendahl's catfish (*Porochilus rendahli*); and
- Sleepy cod (*Oxyeleotris lineolata*).

The results were compared against human health screening criteria (see Table 5-2 in Appendix A).

ECOLOGICAL HEALTH TARGET SPECIES

Target species for the ecological risk assessment vary from the human health risk assessment and largely represent lower trophic organisms that are predated by higher order species.

The target freshwater species for ecological health assessment as designated in the SAQP were:

- Eeltail catfish (*Tandanus tandanus*)
- Eastern rainbowfish (*Melanotaenia splendida*)
- Fresh water mussels (*Velesunio sp.)*
- Spangled perch (*Leiopotherapon unicolour*)
- Freshwater prawn (*Macrobrachium sp.*)

As only freshwater prawns were well represented in the catchment the following additional target species were selected:

- Agassiz's perchlet (Ambassis agassizii);
- Fly-specked hardyhead (Craterocephalus stercusmuscarum); and
- Freshwater shrimp (Atyidae).

Table 3-8 Human and ecological health species caught and selected for analysis.

Common name	Species	Reference	Control	Test					
		Lake Kroombit	Callide Creek U/S	Lake Callide		Callide Creek D/S			
		AB9	AB1	AB2	AB3	AB4	AB5	AB7	AB8
Human health									
Barramundi	*Lates calcarifer*			✓	✓				
Crayfish	*Cherax quadricarinatus*		✓	✓	✓				
Eeltail Catfish	*Tandanus tandanus*	✓	✓	✓		✓			
Hyrtl's Catfish	*Neosilurus hyrtlii*	✓	✓						✓
Rendahl's Catfish	*Porochilus rendahli*		✓			✓	✓		
Sleepy cod	*Oxyeleotris lineolata*		✓			✓			
Yellowbelly	*Macquaria ambigua*		✓						✓
Ecological health									
Agassiz's perchlet	*Ambassis agassizii*	✓	✓		✓	✓	✓	✓	✓
Flyspecked Hardyhead	*Craterocephalus stercusmuscarum*		✓	✓	✓	✓		✓	✓
Freshwater prawn	*Macrobrachium sp.*	✓	✓	✓	✓				
Freshwater shrimp	Atyidae					✓		✓	

RESULTS

Results are presented below for detectable concentrations of PFAS, metal/metalloids and fluoride. Collected data has been tabulated in Appendix E and the relevant laboratory reports are provided in Appendix F.

The results of the human health target species were compared against human health screening criteria values (see Table 5-2 in Appendix A). The results of the ecological health target species were compared against ecological screening criteria values (see Table 5-3 in Appendix A).

Human Health Target Species

No PFOA (Perfluorooctanoic Acid) was detected in any sample, however PFOS[1] (Perfluorooctanesulfonic acid) were detected in five of the six human health targets and values were above guideline levels for each sample tested apart from *O. lineolata* (Figure 3-21). PFOS was detected at both the control site and test sites on Callide Creek and results indicated an increase in PFOS at sites furthest downstream, with the highest values recorded in *N. hyrtlii* at site AB8. The concentration of PFOS within the edible portion on *M. ambigua* was broadly similar to the rest of the body.

No PFOS was detected in biota tissue from either the reference site on Kroombit Lake or the test sites on Lake Callide. It should be noted that PFOS was not detected in barramundi (caught in Lake Callide at sites AB2 and AB3), a species highly likely to be targeted and consumed by humans.

1 PFOS represents PFHxS + PFOS

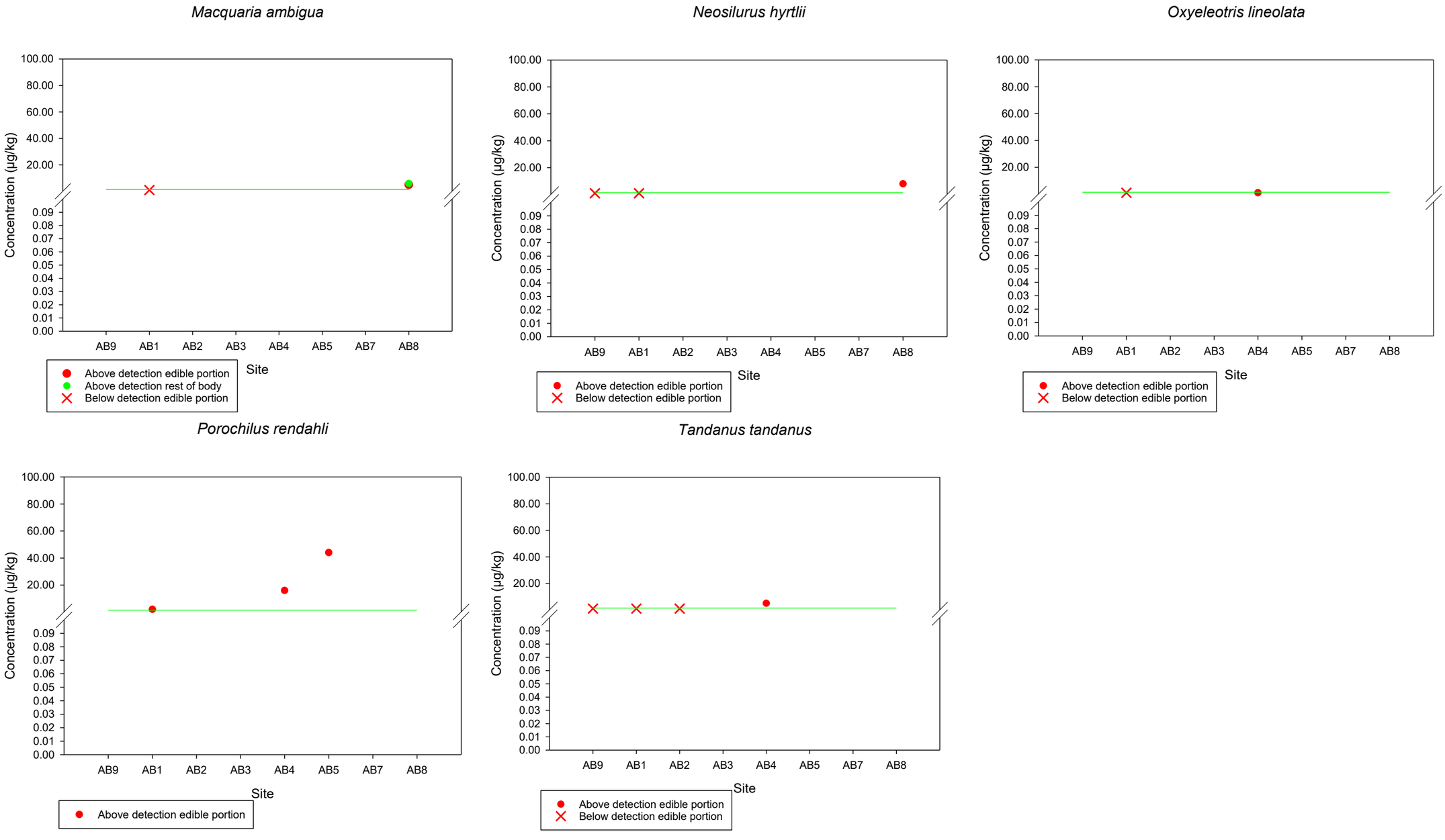


Figure 3-21 PFOS measured from human health target species. Green line represents human health guideline value (NEPM, 2020).

Ecological Health Target Species

PFOS detections were limited to test sites on Callide Creek, with all values except one (Atyidae, AB4) being above both the avian and mammalian diet guideline levels (NEMP, 2020) (Figure 3-22). PFOS concentration showed an increase at sites further downstream, with the highest values recorded in *A. agassizii* at AB8.

There were no detections of PFOS at the reference site on Kroombit Lake, the control site on Callide Creek or at test sites on

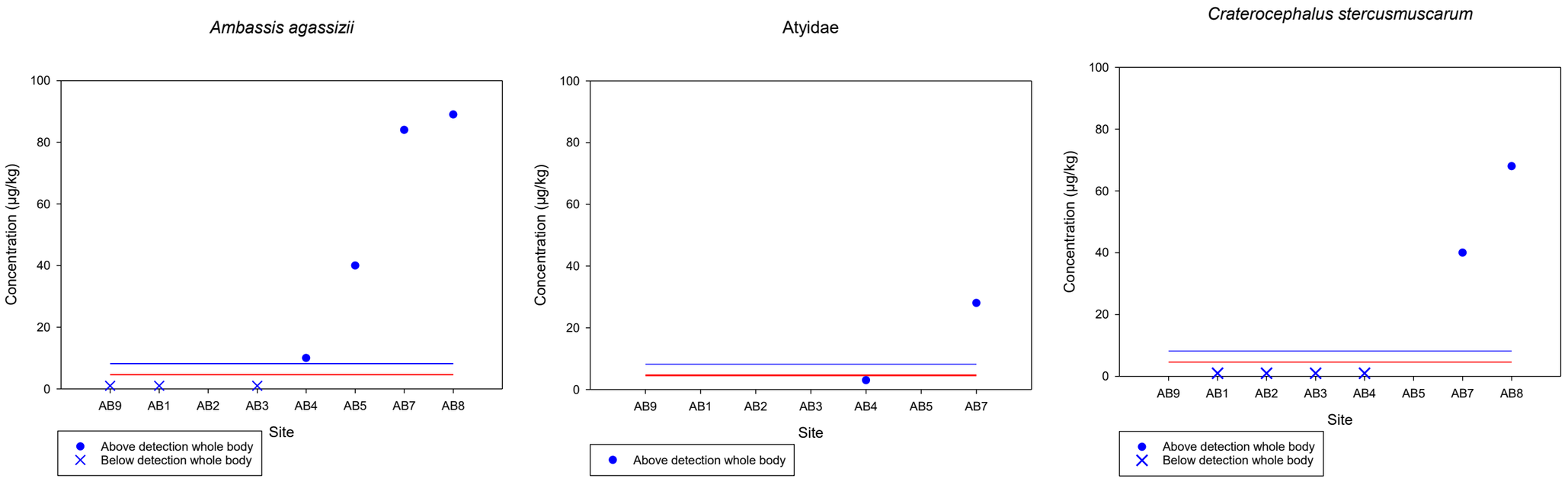


Figure 3-22 PFOS measured from ecological health target species. Lines represents avian (blue) and mammalian (red) diet ecological guideline values (NEMP, 2020).

3.5.2 METALS

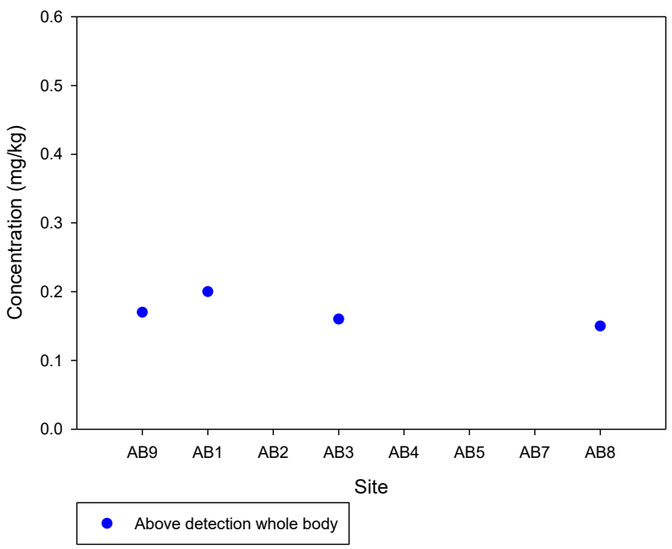
ARSENIC

There are no available guideline values for arsenic in biota tissue therefore the following represents comparative assessment only.

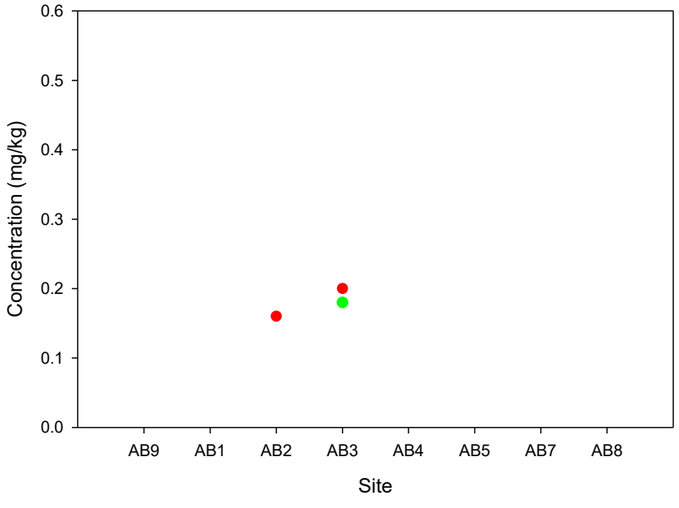
Arsenic was detected at most sites across the study area with no obvious pattern observed. Macrocrustaceans (Atyidae and *Macrobrachium sp*.) tended to have higher arsenic levels than fish, with the highest concentration recorded in *Macrobrachium sp.* at Callide Creek control site AB9. Arsenic is naturally higher in crustacean tissue compared to fish tissue and values do not indicate obvious arsenic contamination in the receiving environment (Stewart & Turnbull, 2015).

Arsenic levels did not vary considerably between the edible portion and the rest of body in the *L. calcarifer* tested.

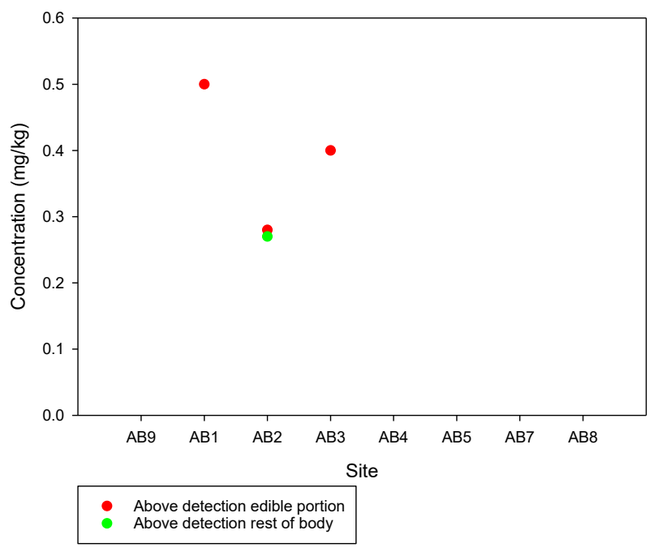
Ambassis agassizii



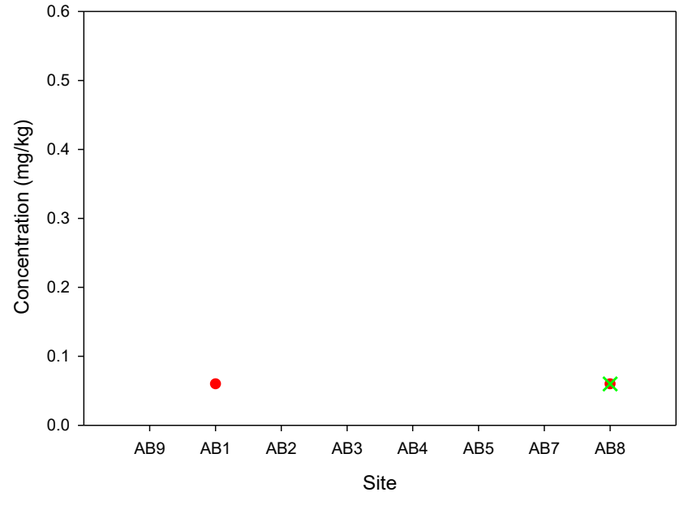
Lates calcarifer



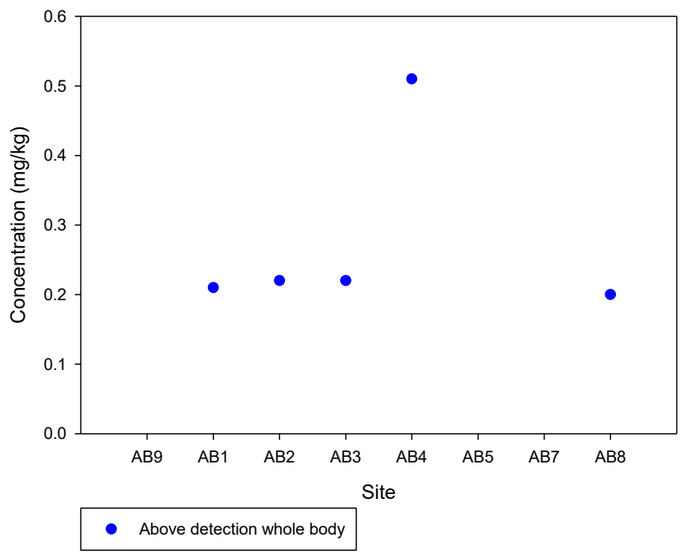
Cherax quadricarinatus



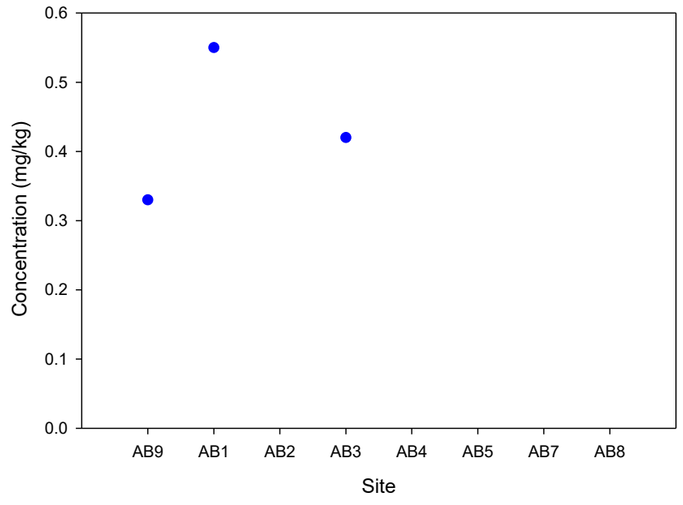
Macquaria ambigua



Craterocephalus stercusmuscarum



Macrobrachium sp.



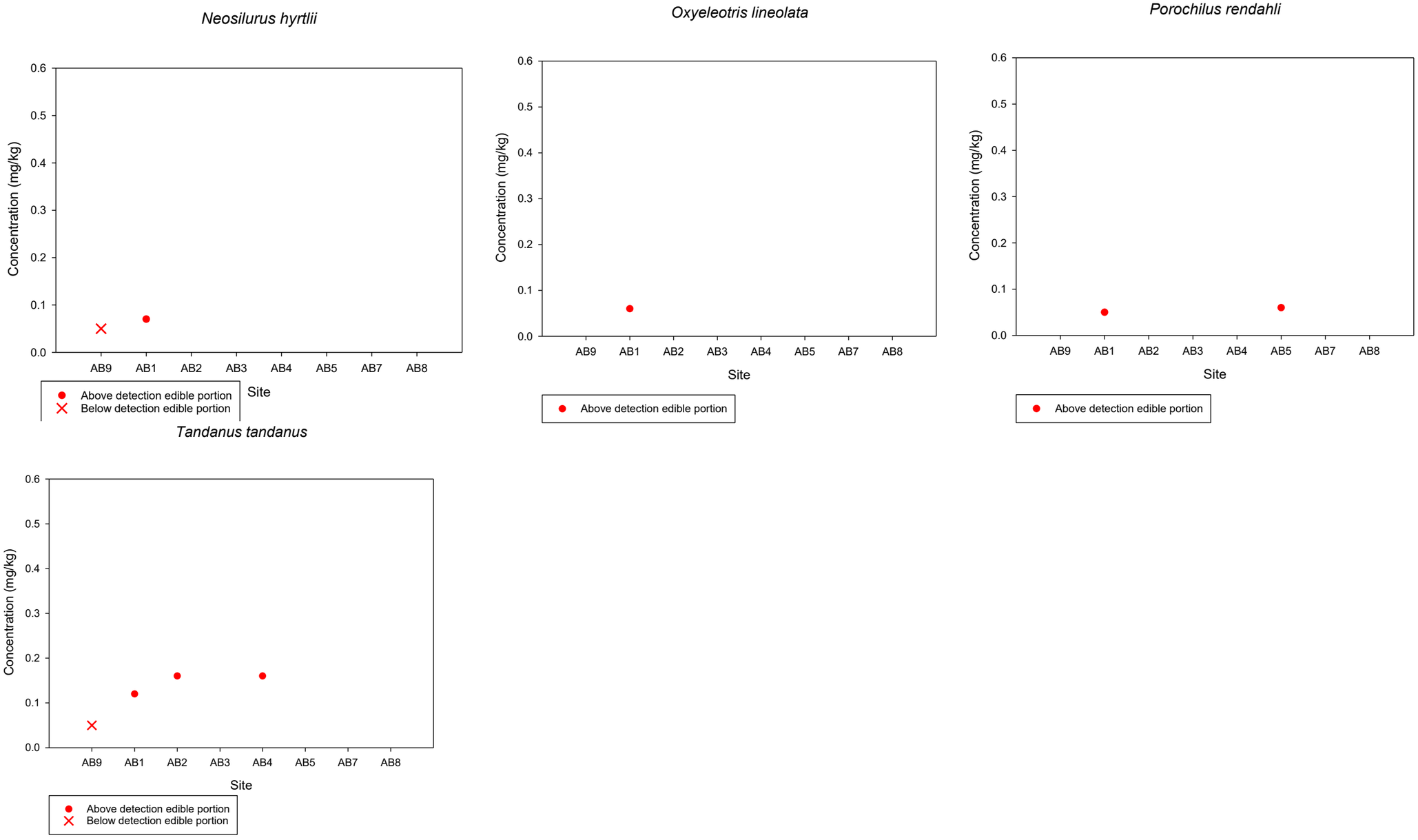


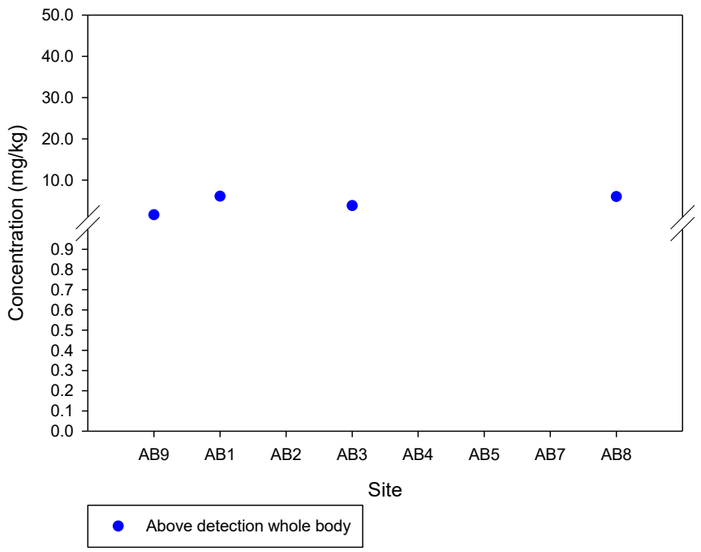
Figure 3-23 Arsenic concentration in biota tissue.

BARIUM

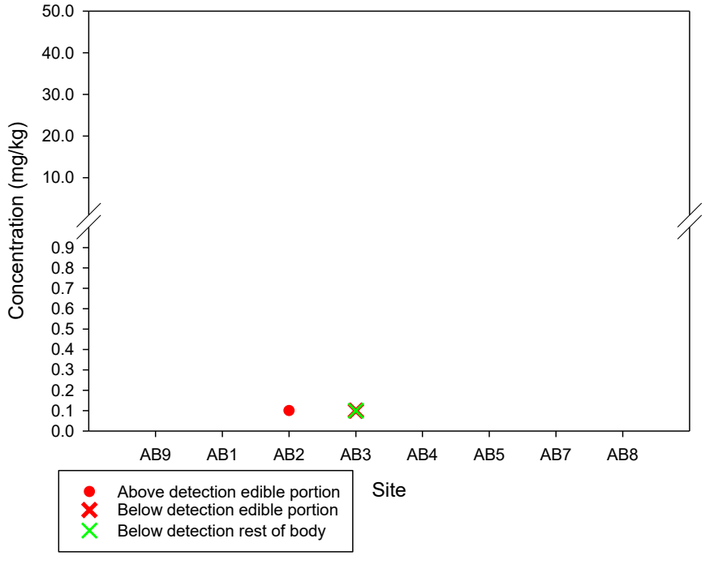
There are no available guideline values for barium in biota tissue therefore the following represents comparative assessment only.

Barium was detected at most sites with no obvious relationship differences between test and control/reference sites (Figure 3-24). Similar to arsenic, levels tended to be higher in macrocrustaceans (*C. quaricarinatus* and *Macrobrachium sp.*,) compared to fish, with the highest value recorded in *C. quadricarinatus* at control site AB1. Barium is known to be naturally higher in crustaceans relative to fish (Verbruggen et al., 2020).

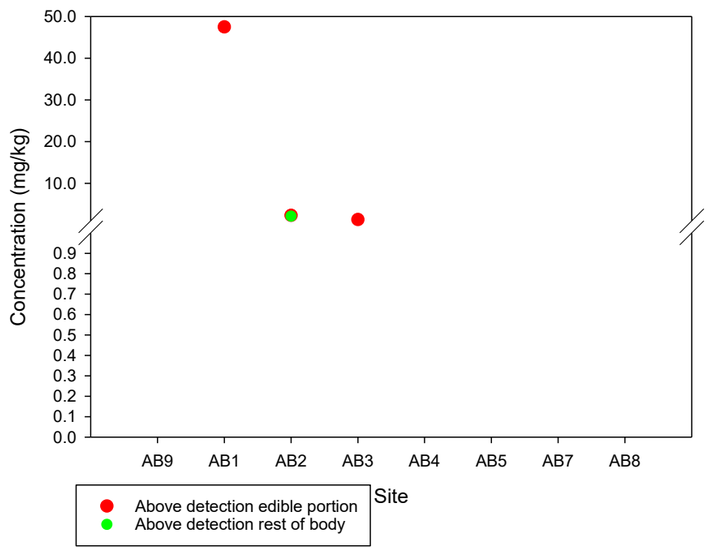
Ambassis agassizii



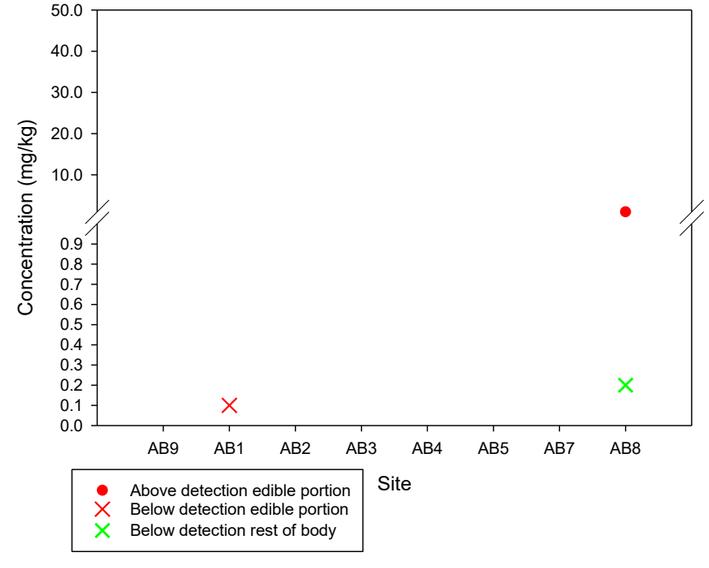
Lates calcarifer



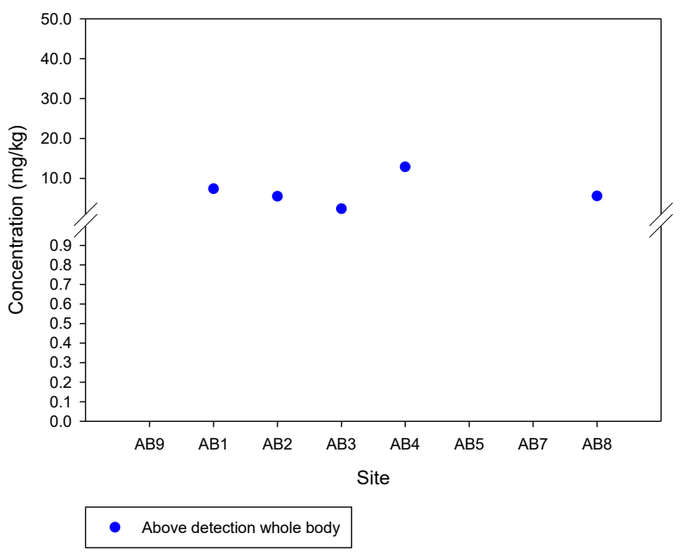
Cherax quadricarinatus



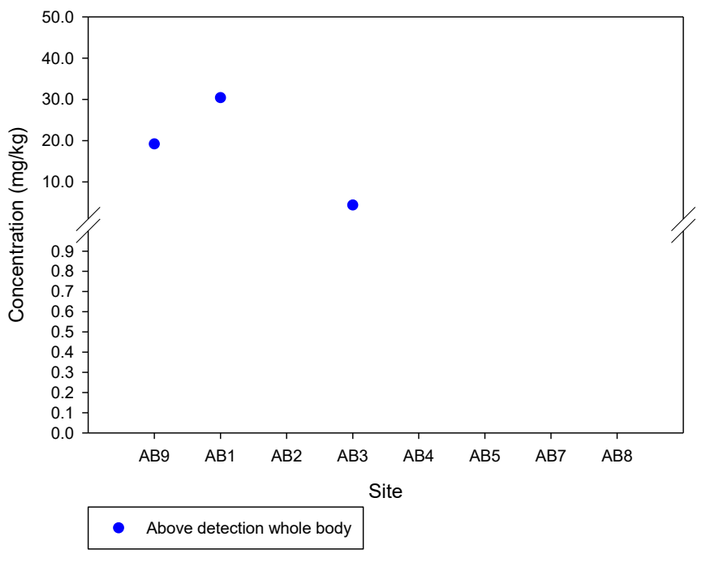
Macquaria ambigua



Craterocephalus stercusmuscarum



Macrobrachium sp.



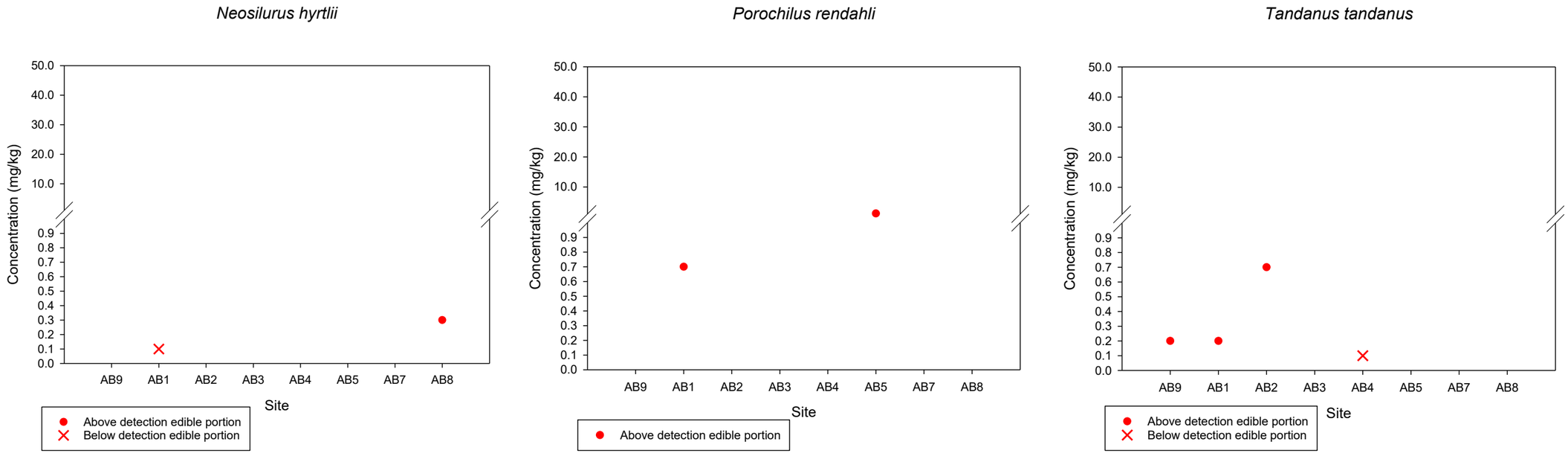


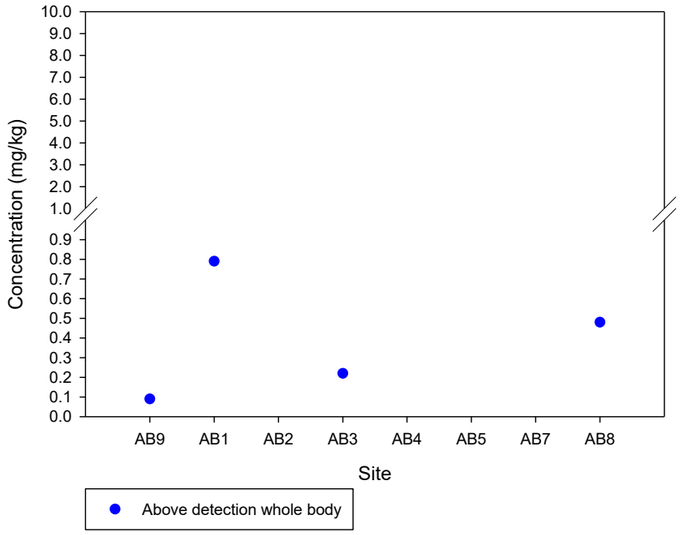
Figure 3-24 Barium concentration in biota tissue.

CHROMIUM

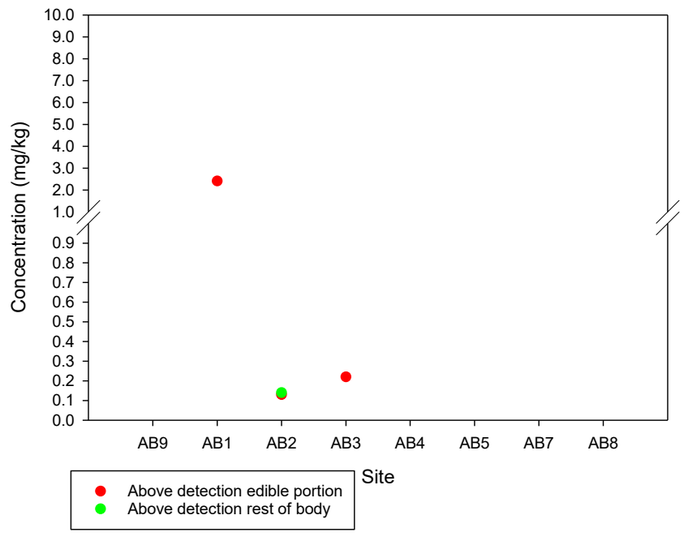
There are no available guideline values for chromium in biota tissue therefore the following represents comparative assessment only.

Chromium was detected at most sites with no obvious relationship between test and control/reference sites, however notable elevations were recorded at control site AB1 and test sites on Lake Callide (Figure 3-25). The highest chromium value was recorded in *T. tandanus* at control site AB1.

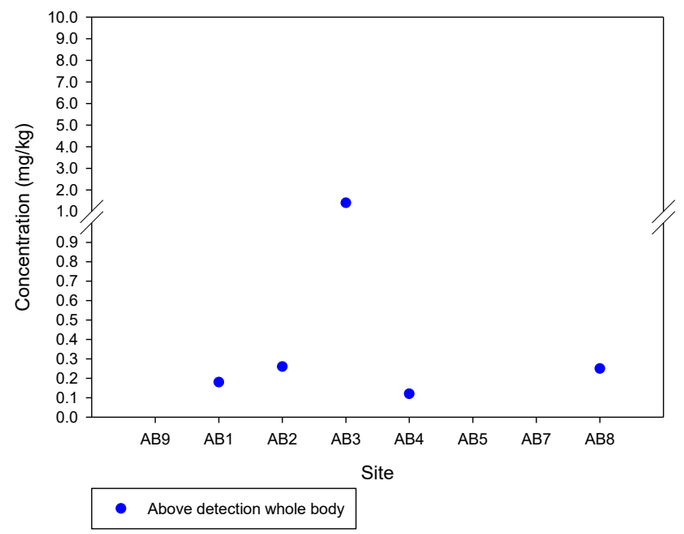
Ambassis agassizii



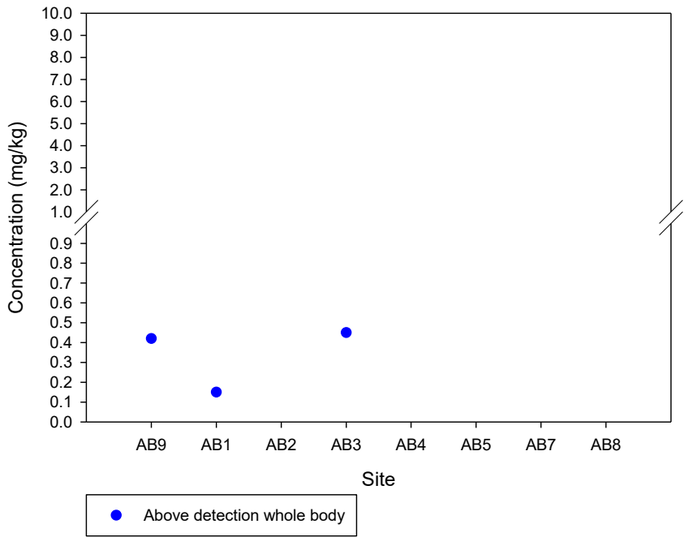
Cherax quadricarinatus



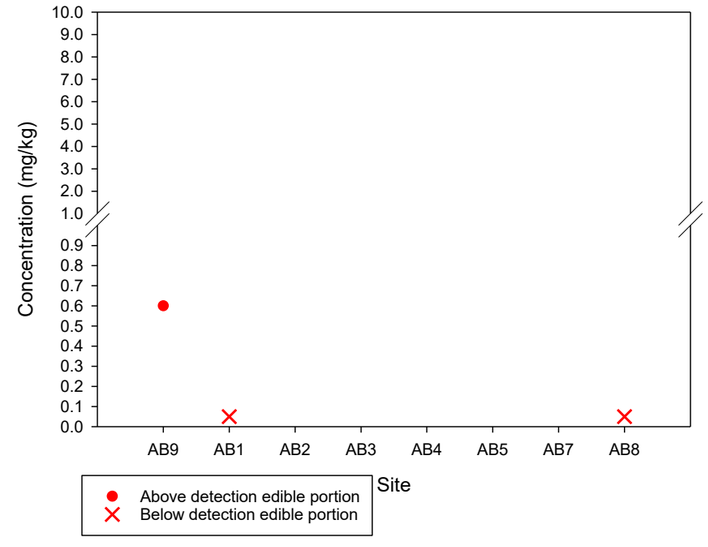
Craterocephalus stercusmuscarum



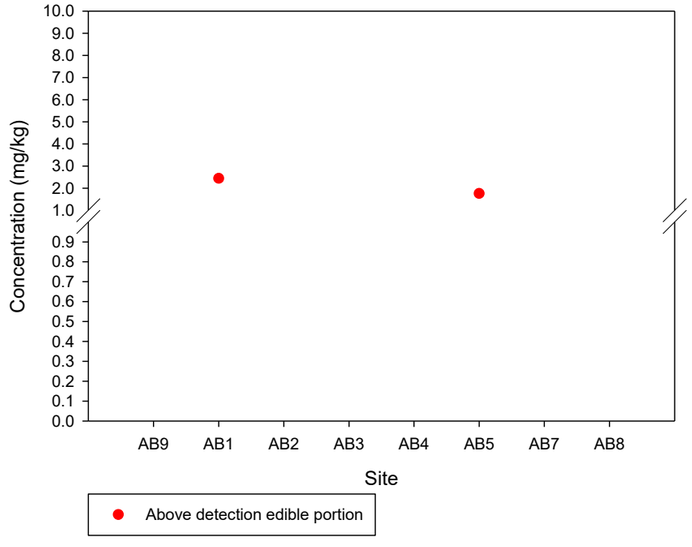
Macrobrachium sp.



Neosilurus hyrtlii



Porochilus rendahli



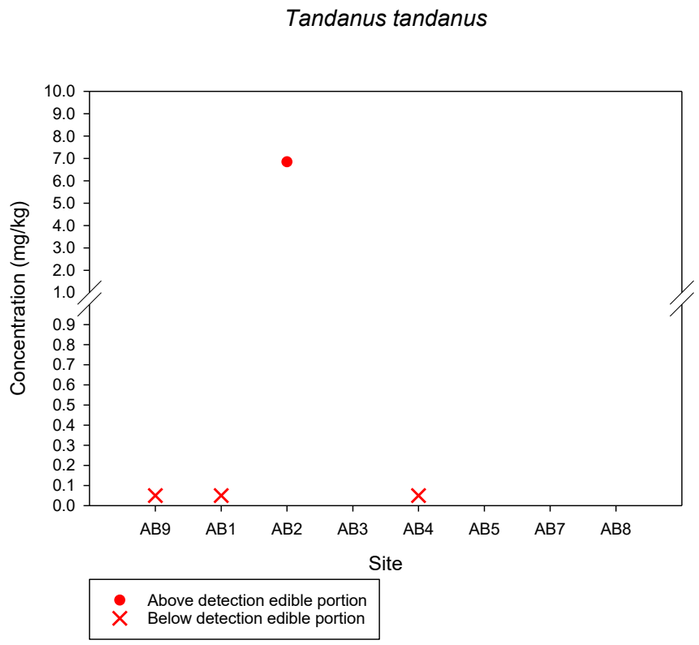
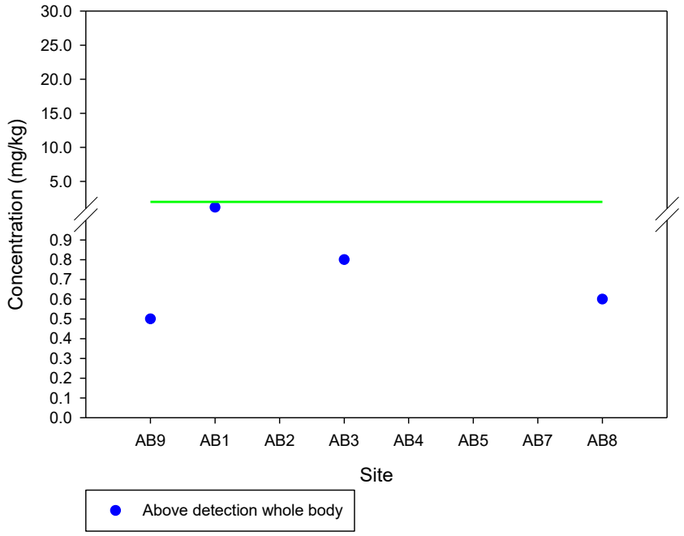


Figure 3-25 Chromium concentration in biota tissue.

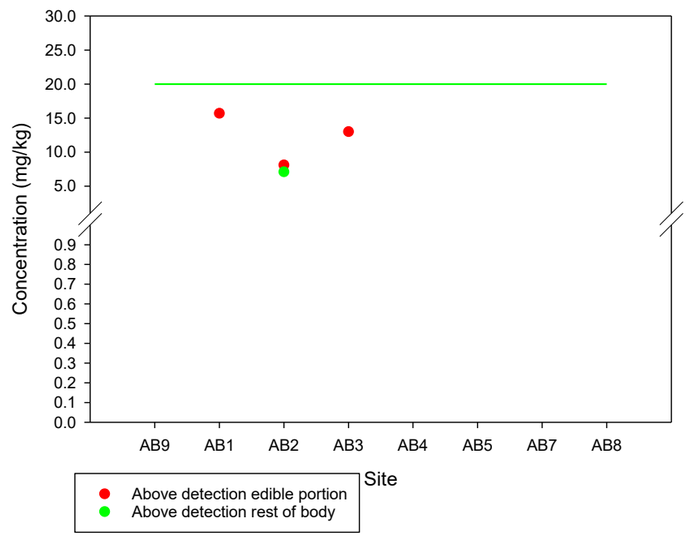
COPPER

Copper was detected at most sites with no obvious relationship between test and control/reference sites (Figure 3-26). All values were below generally expected levels (GELs) except for *Macrobrachium sp.* at control site AB1. Copper levels in the edible portions of *L. calcarifer* and *C. quadricarinatus* were broadly similar to those recorded in the rest of body samples.

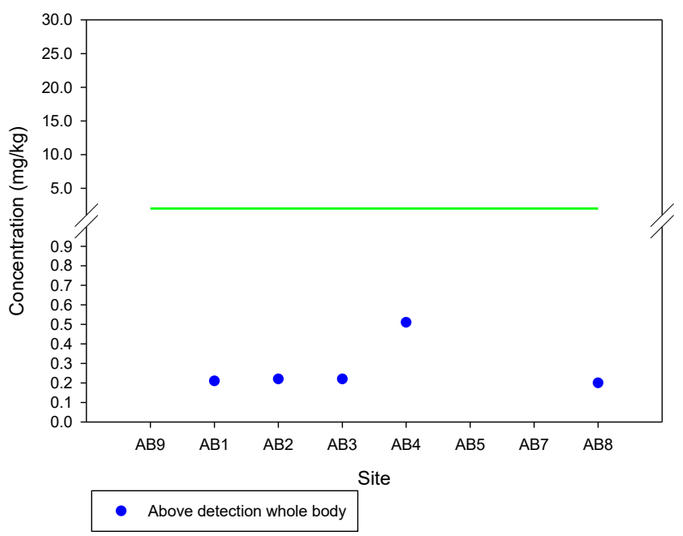
Ambassis agassizii



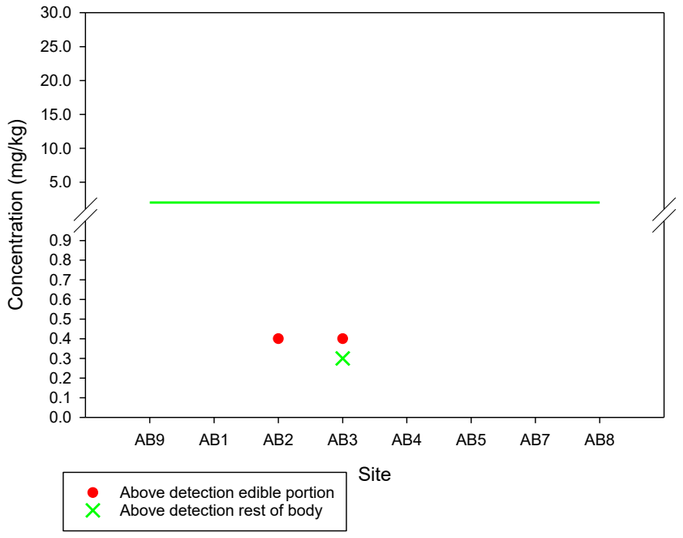
Cherax quadricarinatus



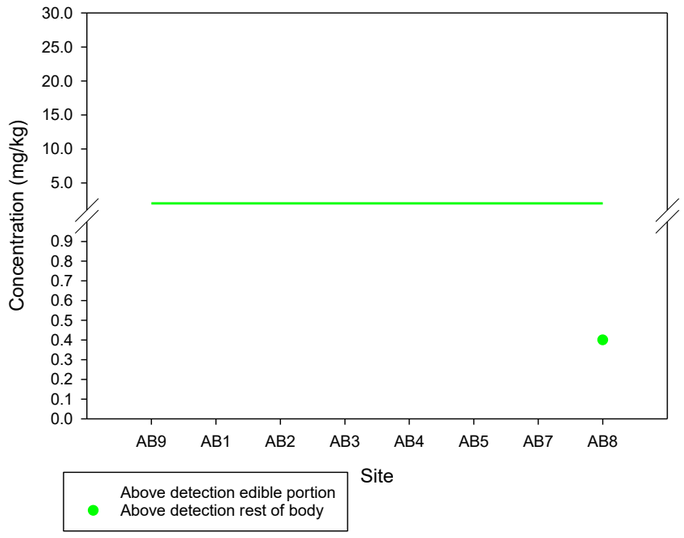
Craterocephalus stercusmuscarum



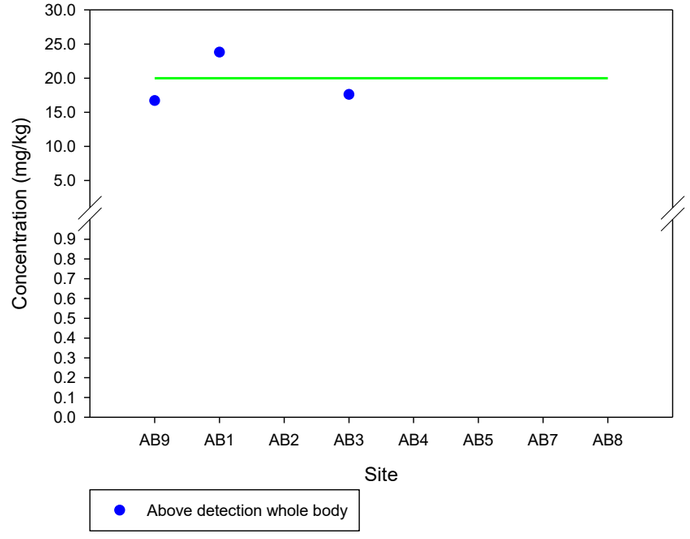
Lates calcarifer



Macquaria ambigua



Macrobrachium sp.



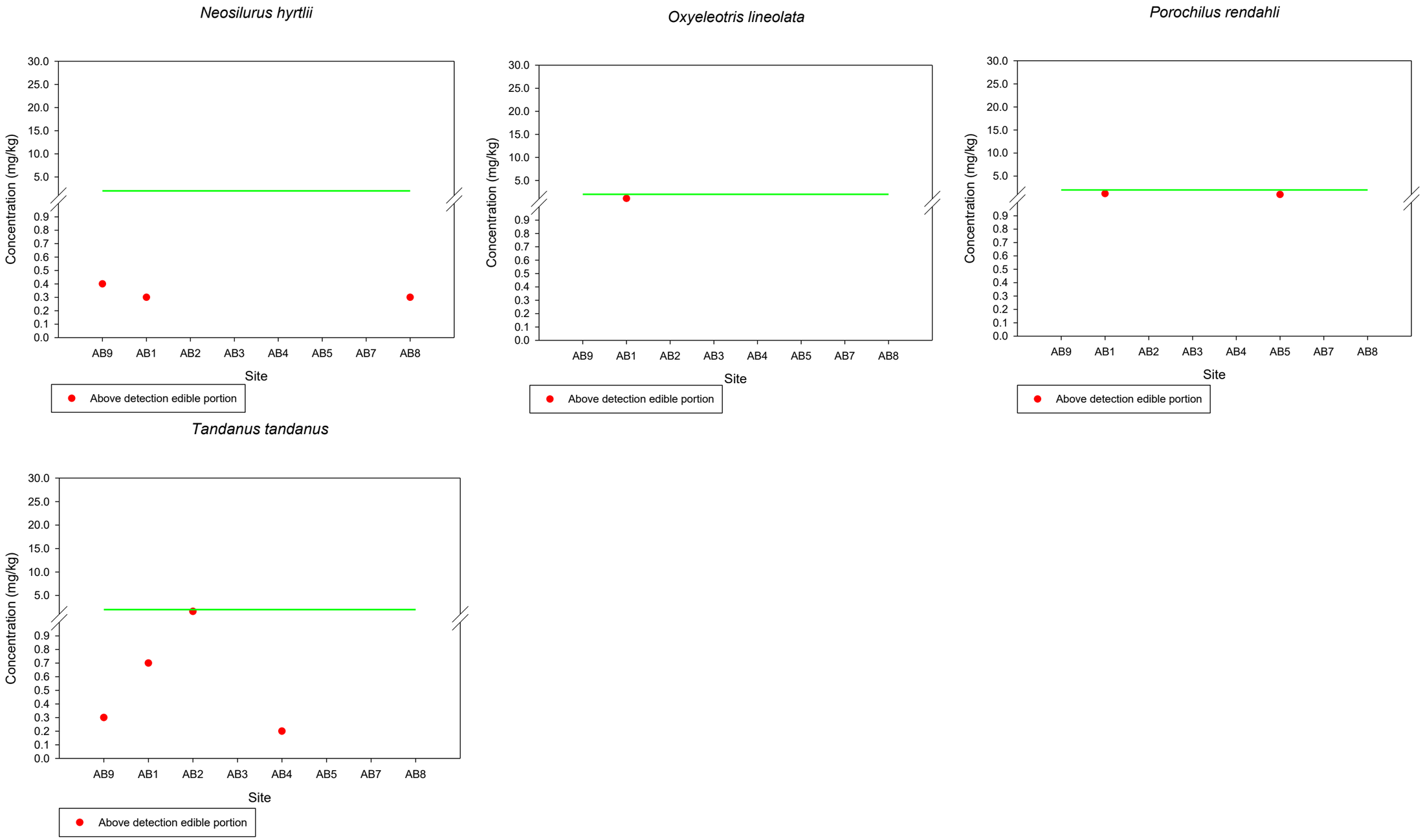
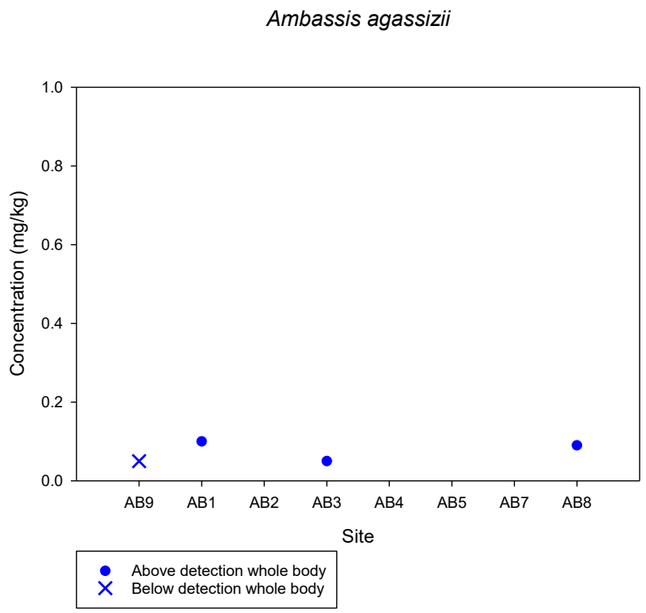


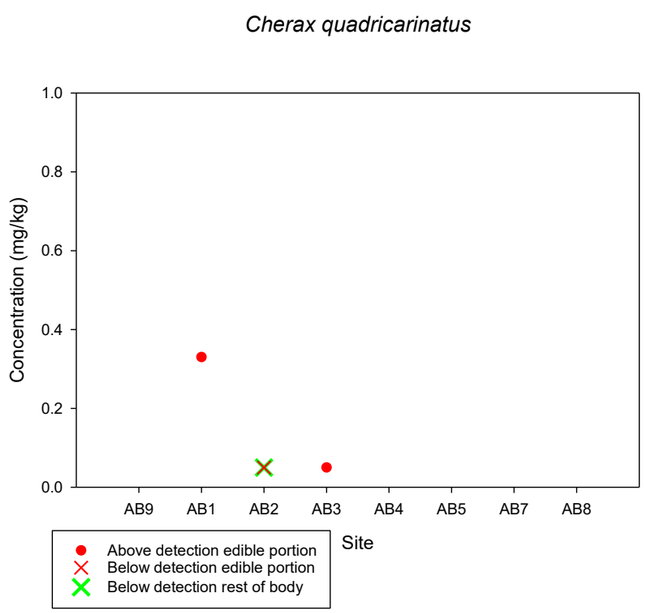
Figure 3-26 Copper concentration in biota tissue. Green lines represent GELs (ANZFA, 2001).

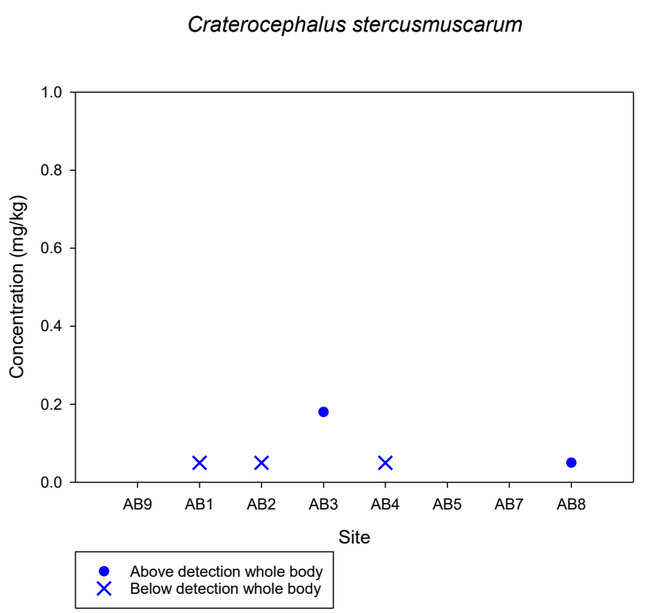
MOLYBDENUM

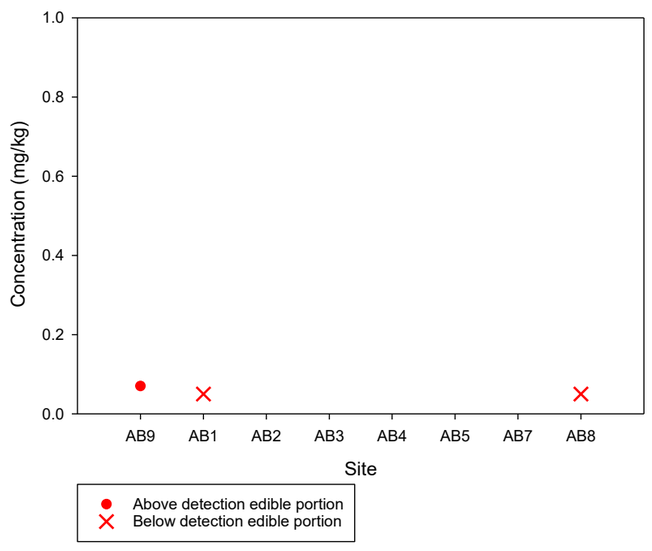
There are no available guideline values for molybdenum in biota tissue therefore the following represents comparative assessment only.

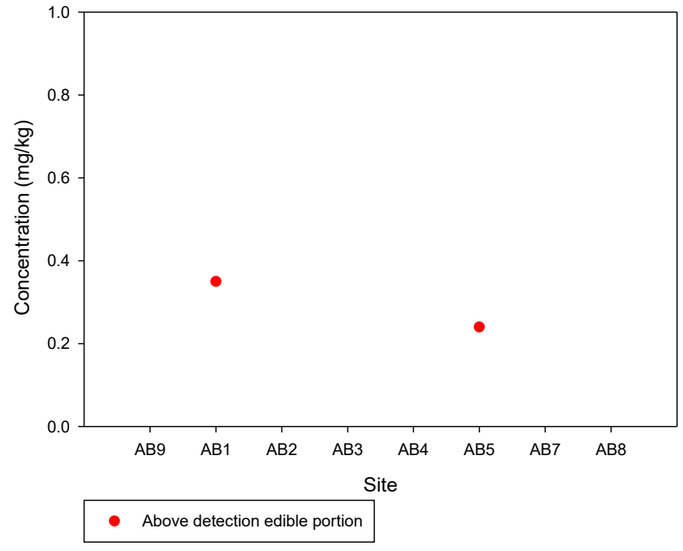
Molybdenum was detected at most sites with no obvious relationship between test and control/reference sites (Figure 3-27). No molybdenum was detected in either the edible portion or rest of body sample from *N. hyrtlii* at site AB2.











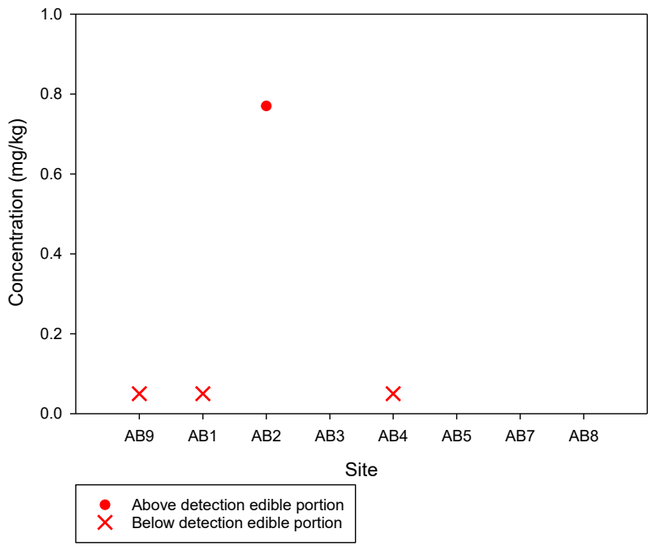
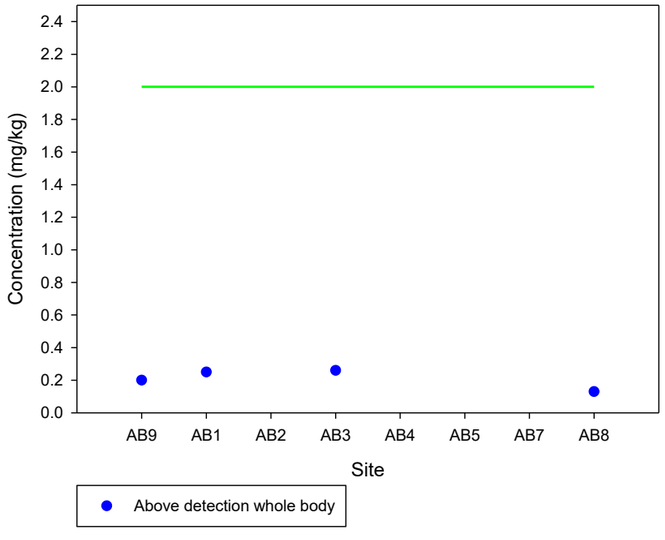


Figure 3-27 Molybdenum concentration in biota tissue.

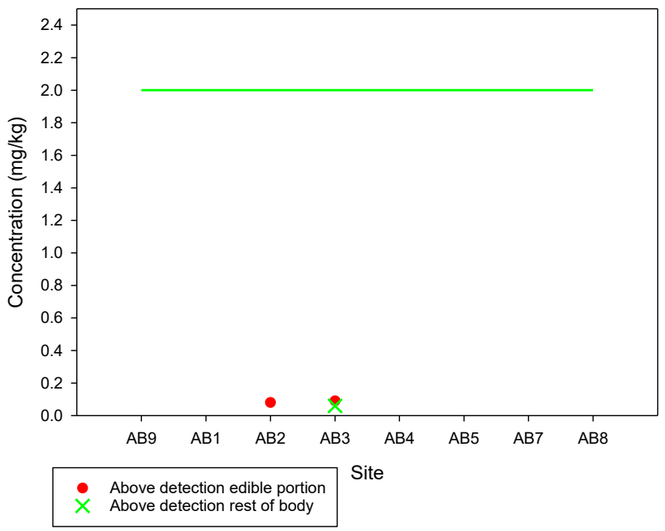
SELENIUM

Selenium was detected at most sites with no obvious relationship between test and control/reference sites (Figure 3-28). Levels were below GELs for all sites and there was no difference in concentrations between the edible portion and rest of body samples.

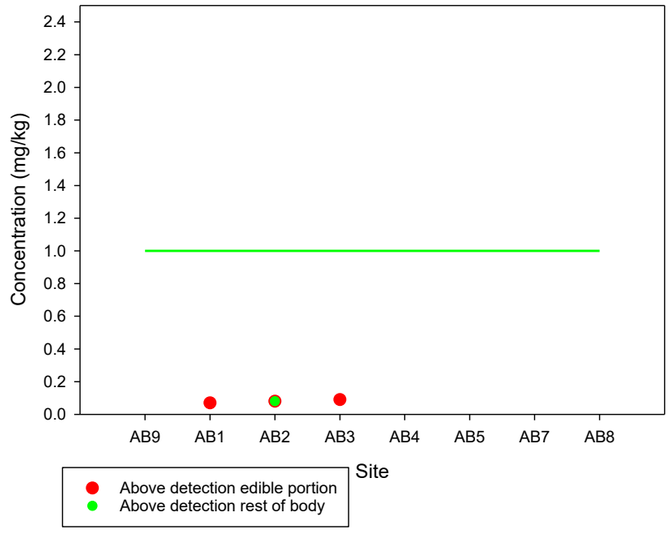
Ambassis agassizii



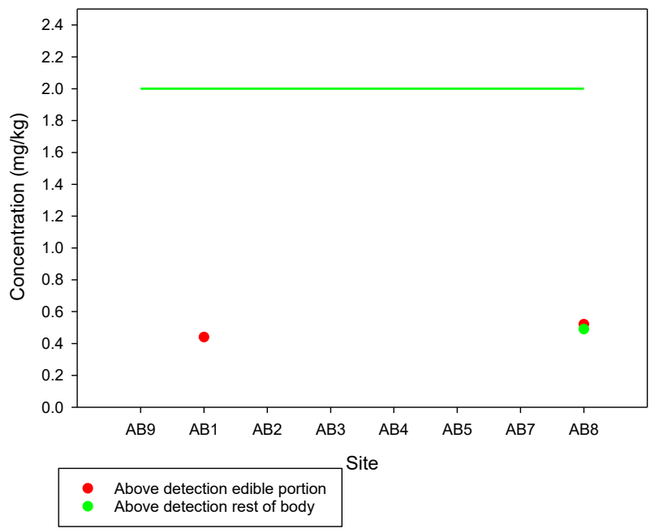
Lates calcarifer



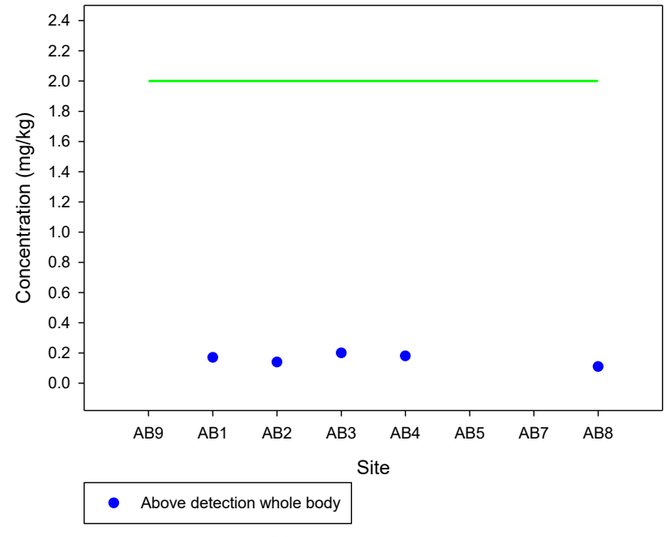
Cherax quadricarinatus



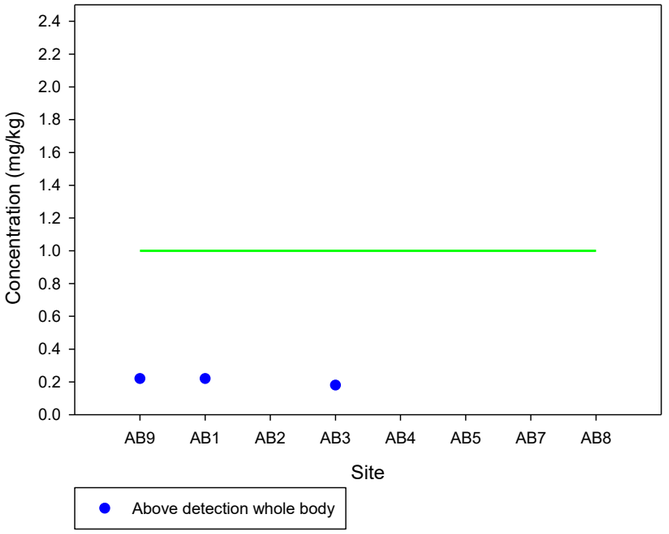
Macquaria ambigua



Craterocephalus stercusmuscarum



Macrobrachium sp.



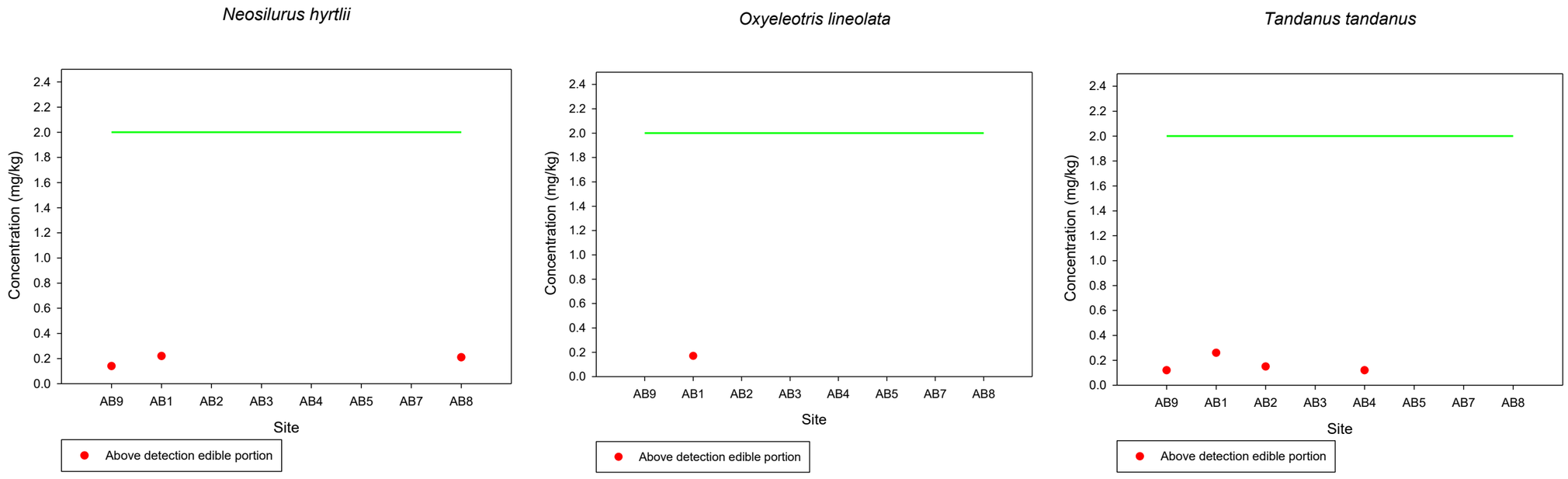


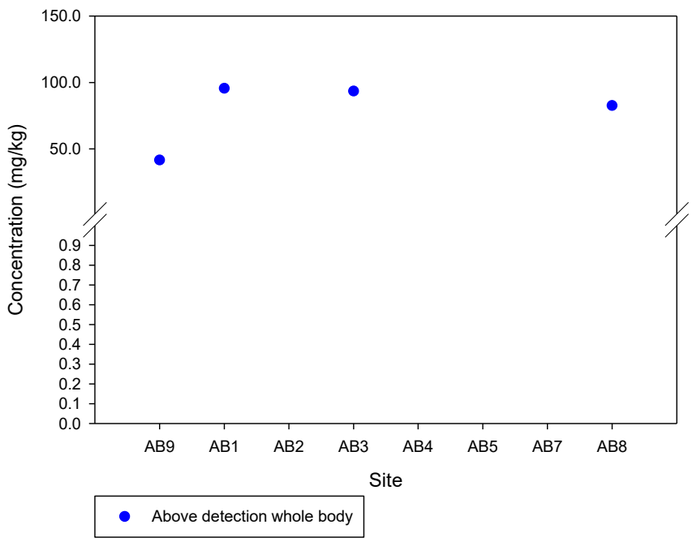
Figure 3-28 Selenium concentration in biota tissue. Green lines represent GELs (ANZFA, 2001).

STRONTIUM

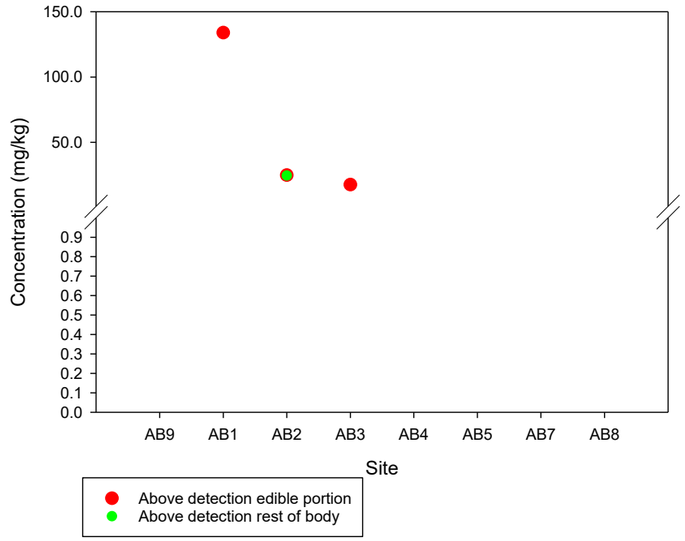
There are no available guideline values for stontium in biota tissue therefore the following represents comparative assessment only.

Strontium was detected at most sites with no obvious relationship between treatments (Figure 3-29). Strontium levels were broadly similar in the edible portion and rest of body samples.

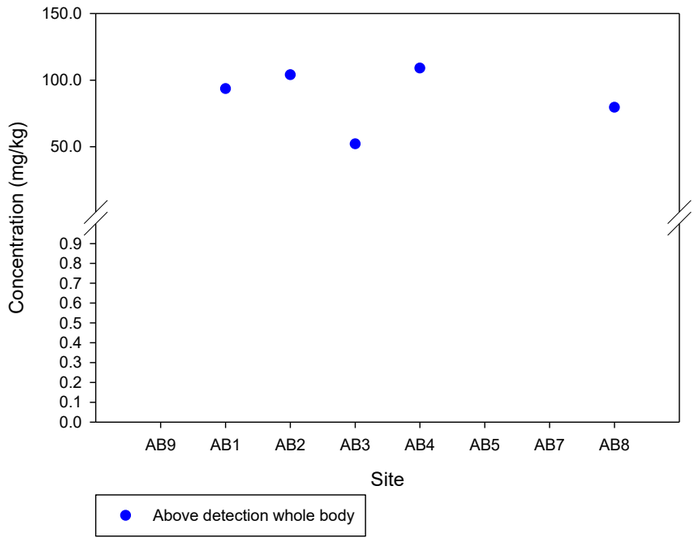
Ambassis agassizii



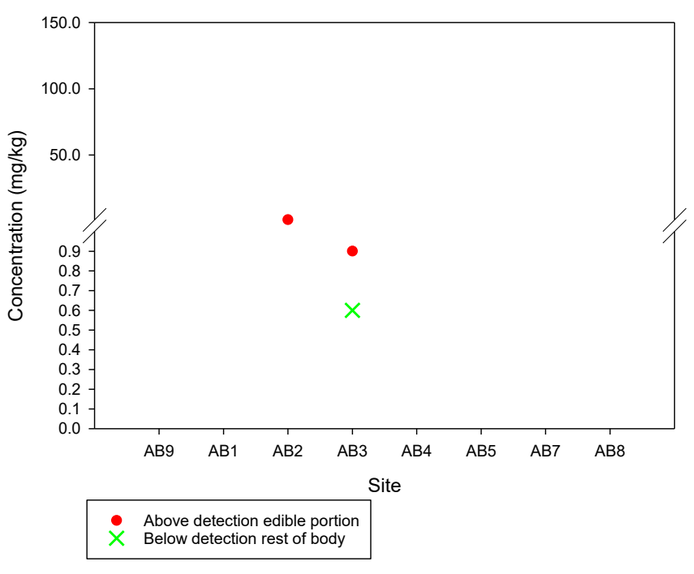
Cherax quadricarinatus



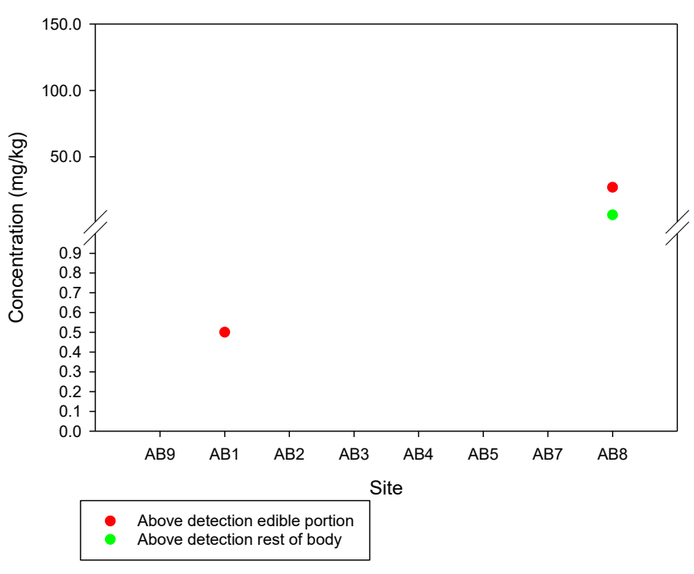
Craterocephalus stercusmuscarum



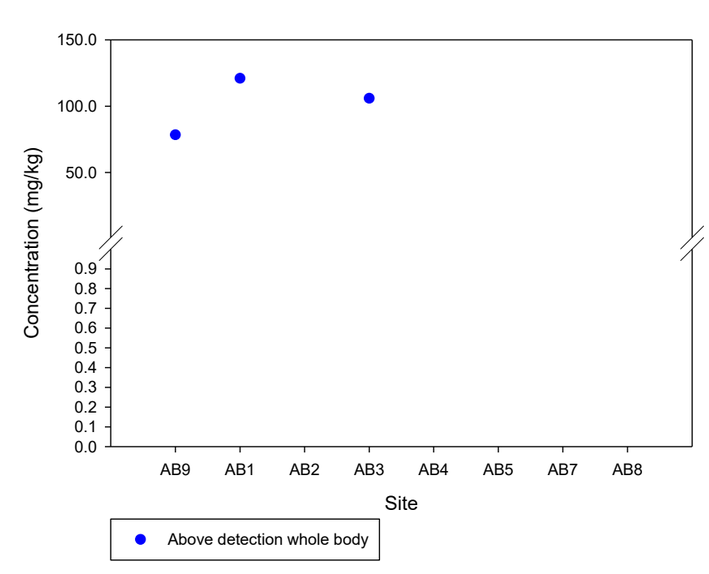
Lates calcarifer



Macquaria ambigua



Macrobrachium sp.



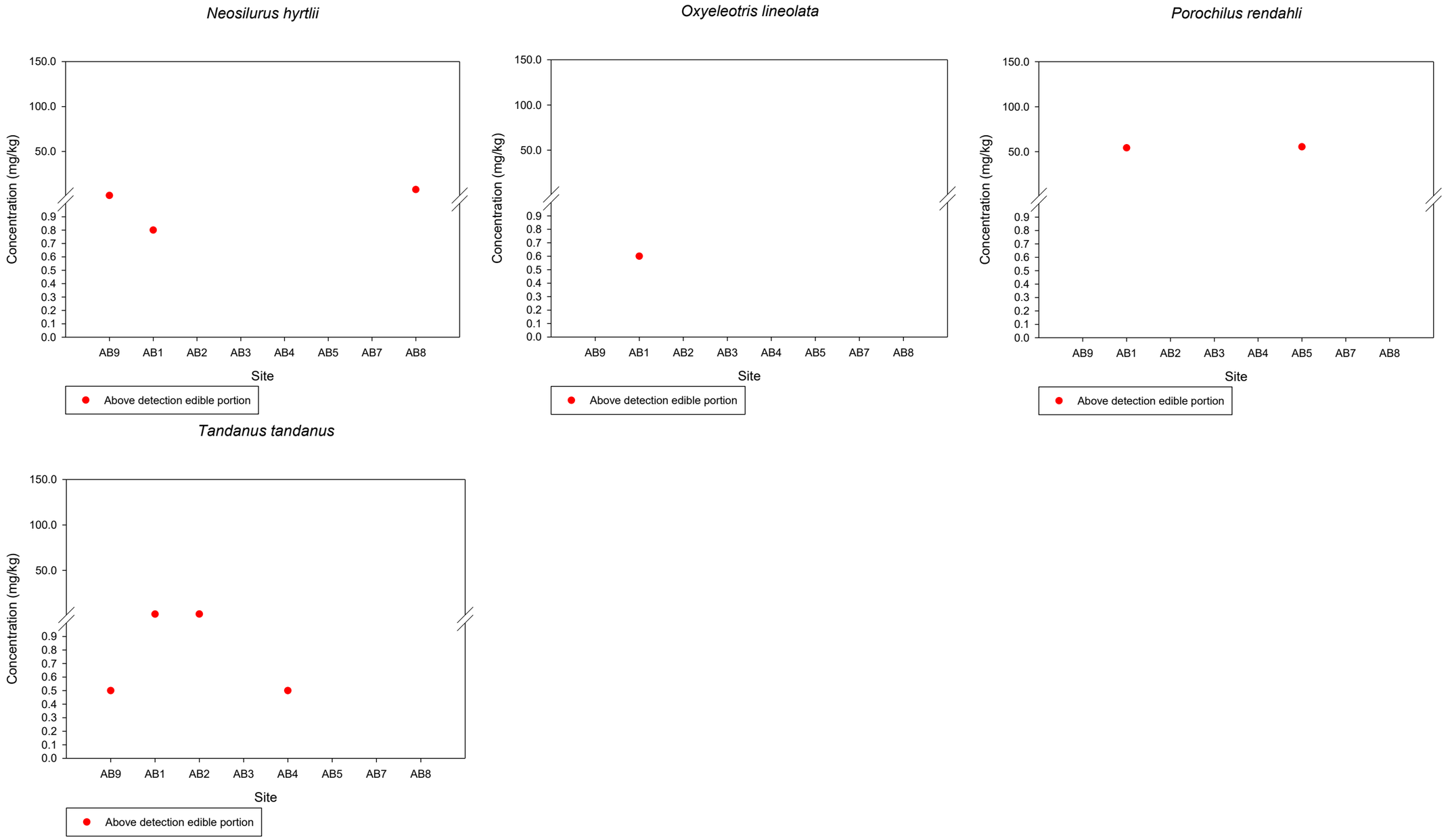


Figure 3-29 Strontium concentration in biota tissue.

VANADIUM

There are no available guideline values for vanadium in biota tissue therefore the following represents comparative assessment only.

Vanadium detection was limited to a single sample of *T. tandanus* at Lake Callide test site AB2 (Figure 3-30).

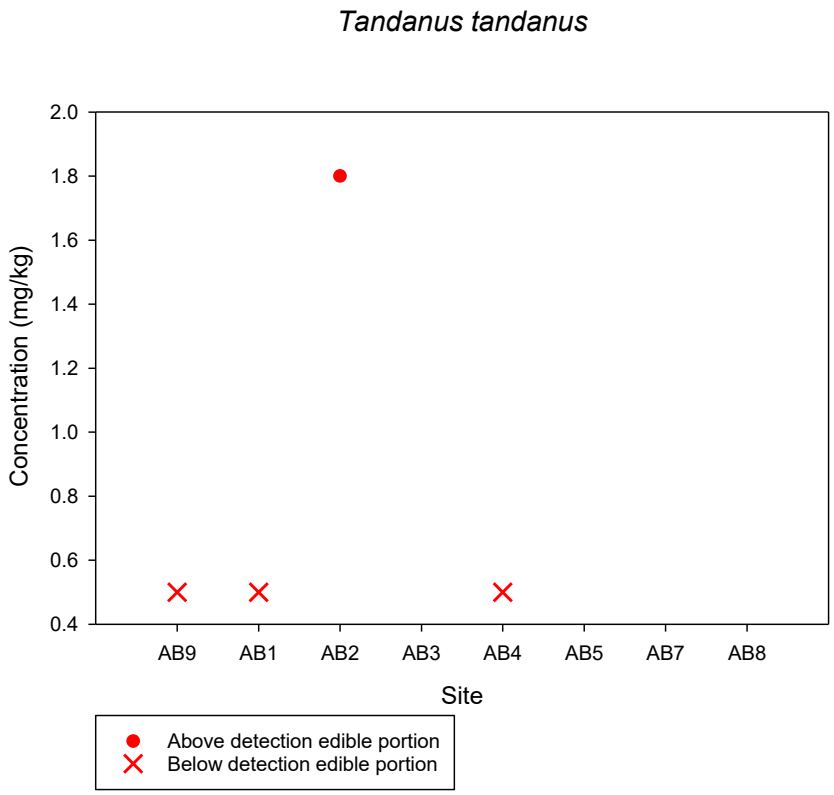
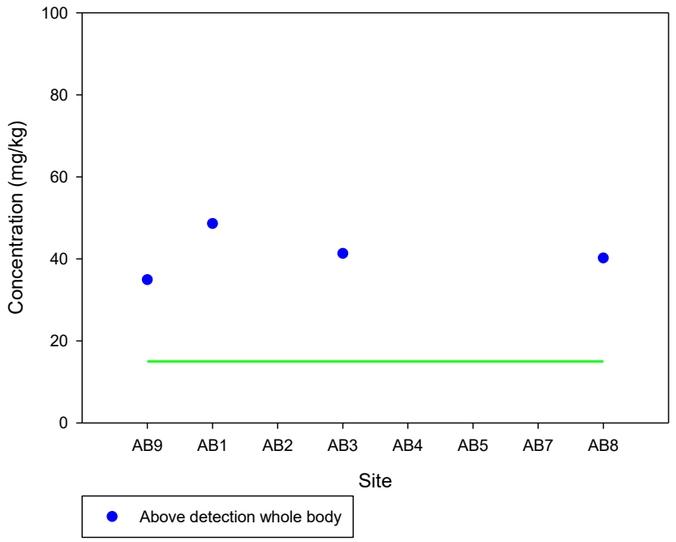


Figure 3-30 Vanadium concentration in biota tissue.

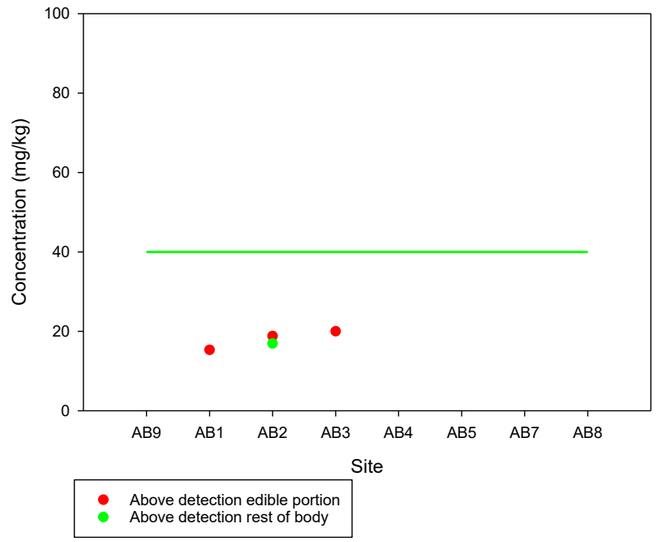
ZINC

Zinc was detected at most sites with no obvious relationship between treatments (Figure 3-31). Values were above GELs for *A. agassizii*, *C. stercusmuscarum*, *Macrobrachium sp.* and *P. rendahli*, with exceedances occurring at the reference site in Kroombit Lake, both control and test sites on Callide Creek and within Lake Callide. Zinc levels were similar between edible portion and rest of body samples.

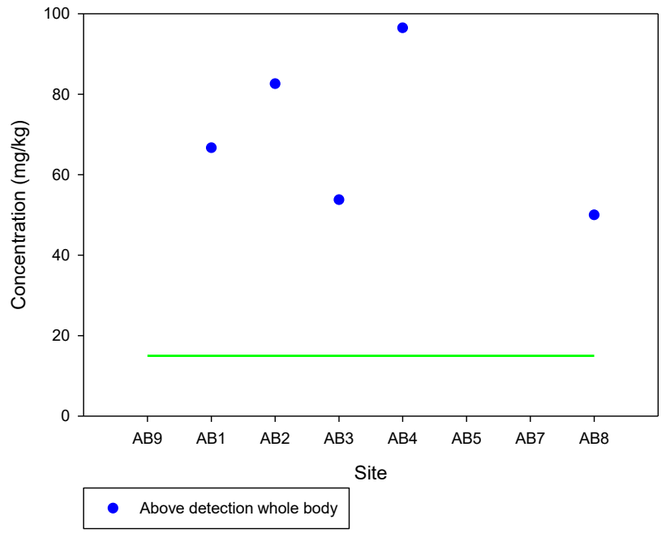
Ambassis agassizii



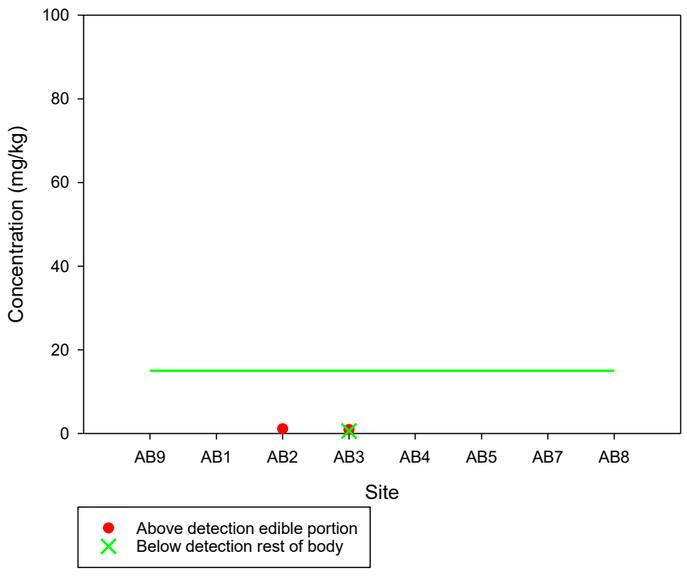
Cherax quadricarinatus



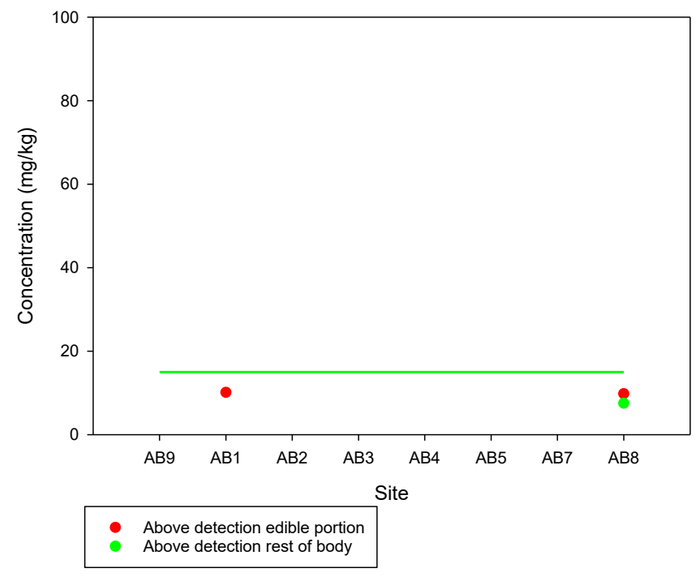
Craterocephalus stercusmuscarum



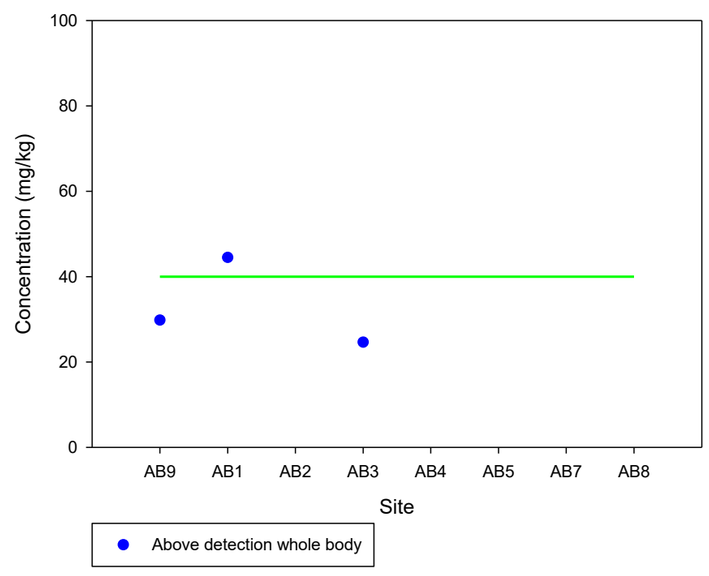
Lates calcarifer



Macquaria ambigua



Macrobrachium sp.



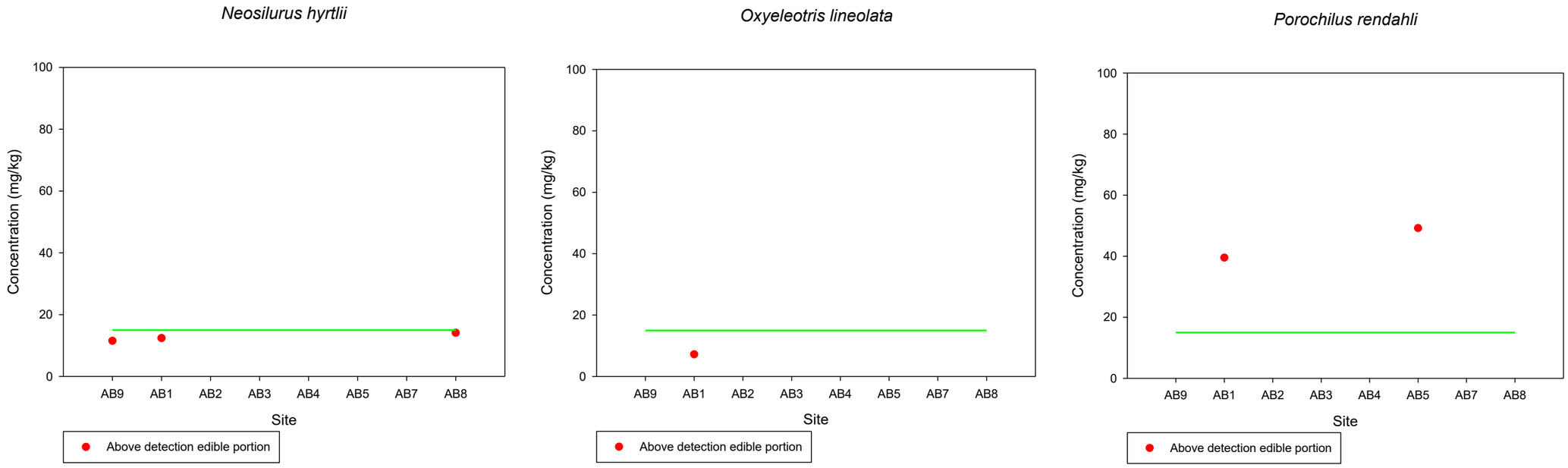


Figure 3-31 Zinc concentration in biota tissue.

THORIUM

There are no available guideline values for thorium in biota tissue therefore the following represents comparative assessment only.

Thorium detections were limited to the control site AB1 and Callide Lake test site AB2, with no detections recorded at Lake Kroombit reference site AB9.

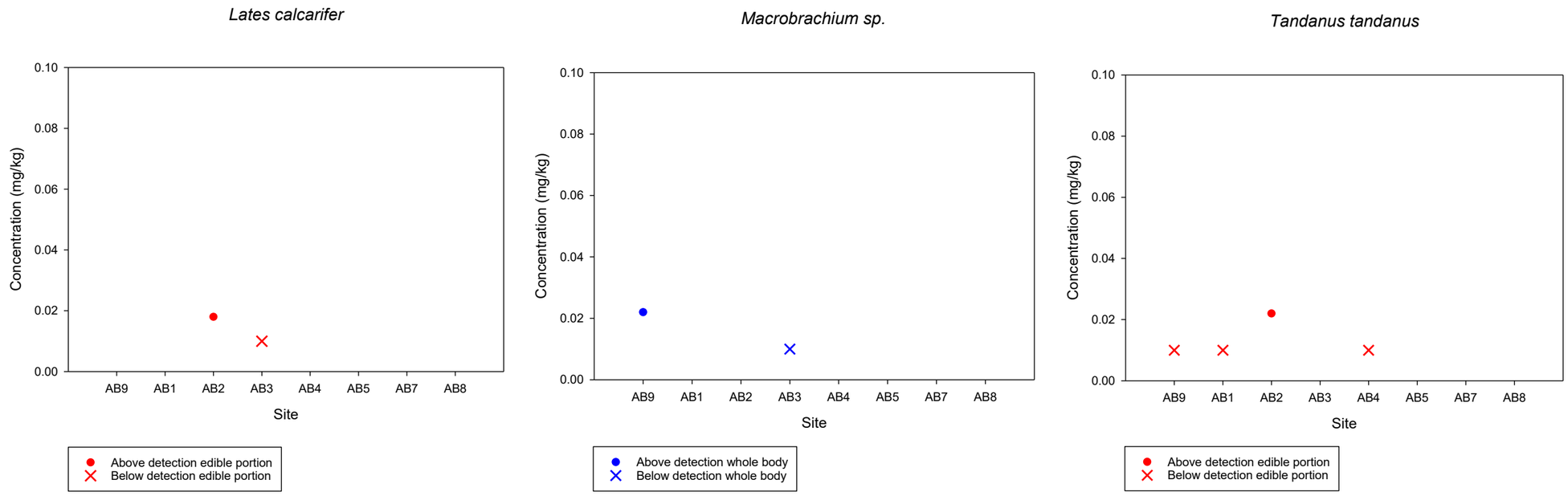


Figure 3-32 Thorium concentration in biota tissue.

FLUORIDE

There are no available guideline values for fluoride in biota tissue therefore the following represents comparative assessment only.

Fluoride was detected at just two sites; Lake Callide test site AB3 and Callide Creek test site AB8 (Figure 3-33).

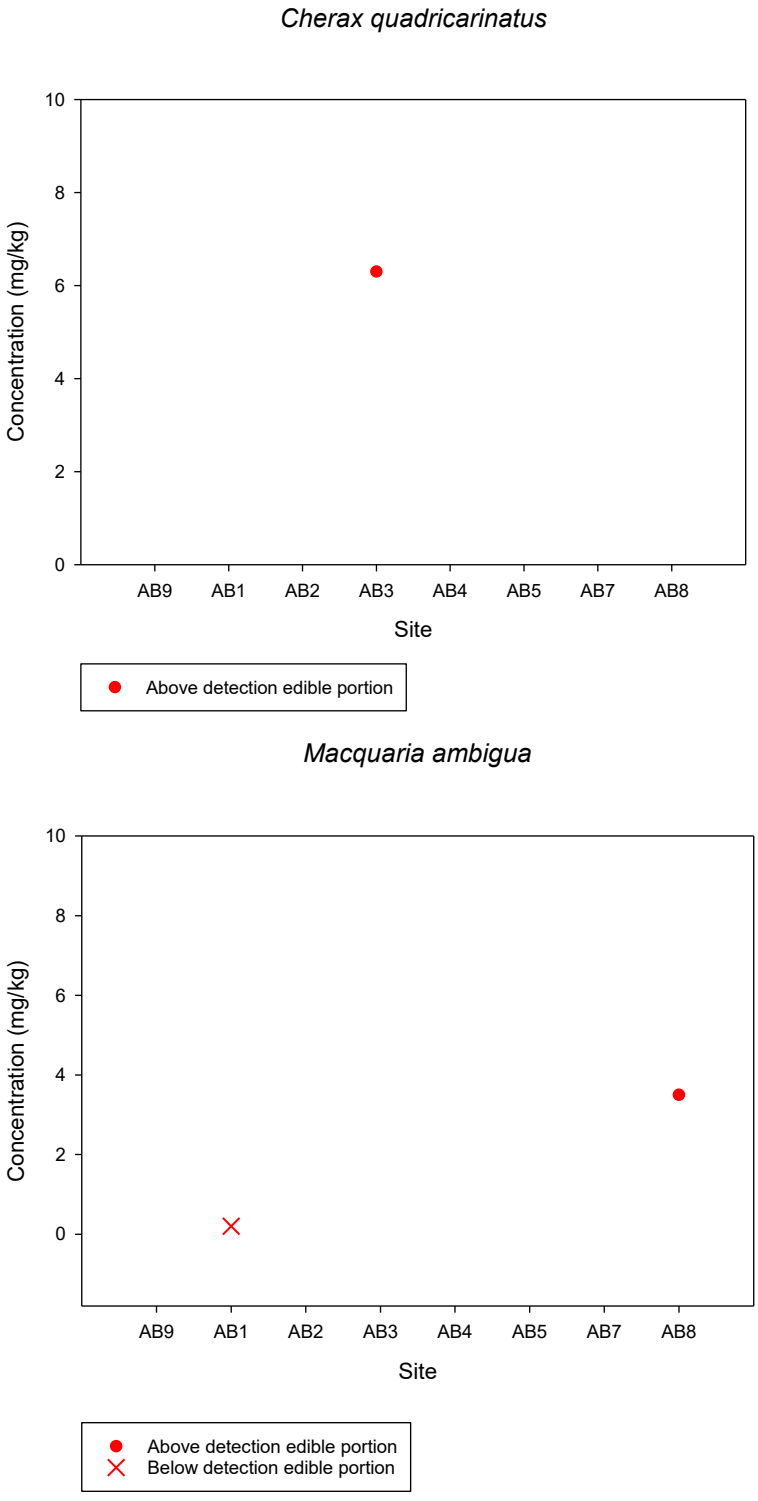


Figure 3-33 Fluoride concentration in biota tissue.

3.5.3 SUMMARY

The results of the biota tissue analysis are summarised in Table 3-8.

PFOS concentrations in biota appear increase downstream and are highest at the site furthest downstream (AB8). It should also be noted that site AB8 is downstream from the township of Biloela which may be another potential source of PFOS. PFOS was also detected in biota at the control site upstream of CP on Callide Creek (AB1).

There were no detections of PFOS within Lake Callide, which reflects surface water sampling in the lake, where PFOS was either not detected or was present at low levels. Interestingly, PFOS concentrations were relatively low at site AB4, despite being closest in positioned in proximity to the CPS, however it should be noted that this site is located just upstream of the main channel draining the CPS, potentially away from the bulk of PFOS influence.

Most of the fish species identified in the current study are potamodromus, meaning that they may migrate upstream and downstream during their lifecycle. The movement habits and subsequent degree of PFOS exposure of the fish analysed in the current study is unknown and could have potentially influenced results. Fish movement in the catchment is influenced by seasonal flow patterns and barriers to fish movement, these include the dam wall at Lake Callide and Callide Weir.

There was no obvious difference between contaminant concentrations between the edible portions and rest of body samples where these were analysed separately. This indicates that contaminants do not appear to accumulate in certain organs/body parts.

Table 3-9 Biota tissue analysis results summary.

Contaminant	Trends and observations regarding treatments	Trends and observations regarding species
PFOS	Detected at both control sites and test sites on Callide Creek with an increasing trend downstream on Callide Creek	Large-bodied predators (*M. ambigua*), large/medium predator/omnivores (*O. lineolata* and various eel-tail catfish) that may be consumed by humans. Small-bodied micropredator/omnivores (e.g *A. aggassizii*) and scavengers (Atyidae) likely consumed by higher order organisms.
Arsenic	No obvious trend	Higher concentration in macrocrustaceans
Barium	No obvious trend	Higher concentration in macrocrustaceans
Chromium	No obvious trend	No obvious trend
Molybdenum	No obvious trend	No obvious trend
Selenium	No obvious trend	No obvious trend
Vanadium	No obvious trend	Detection limited to a single eel-tail catfish in Lake Callide
Zinc	No obvious trend	No obvious trend - values above guideline levels for most species

Contaminant	Trends and observations regarding treatments	Trends and observations regarding species
Thorium	No obvious trend	No obvious trend
Fluoride	No obvious trend	Detection limited to a single large bodied predator (*M. ambigua*) and medium-bodied scavenger (*C. quadricarinatus*) that may be consumed by humans

4. CONCLUSION

The habitat condition, aquatic biota, and macroinvertebrate communities varied between control/reference sites and test sites. Upstream of Callide Dam within Callide Creek habitat condition was excellent and aquatic biota and macroinvertebrates were abundant and diverse for this system. Downstream some disturbance was evident based on the state of the habitat, water quality, and macroinvertebrate assemblages. Habitat quality overall was in good to excellent condition, with most sites limited due to lower water depth, availability of micro and macrohabitats and by high fine sediment content. Lake Callide, a larger water body with sections of sheltered habitat was able to support similar, and in some cases more diverse aquatic biota and macroinvertebrates communities than the comparable reference site Lake Kroombit. Analysis of historical water quality showed that site AB4 had high conductivity (2,631µS/cm) and that dissolved oxygen (%saturation) was relatively low across all sites, in particular downstream of Lake Callide.

PFOS was detected in biota at sites on Callide Creek both upstream and downstream of the CP with most concentrations being above human and ecological health guideline levels. No PFOS was detected in Lake Callide or within Lake Kroombit. PFOS concentrations appear to increase with increasing distance downstream of CPS, with the highest concentrations recorded at the furthest downstream site. Concentration of metals and fluoride did not show an obvious trend across treatments. Where guidelines (generally expected levels) were available, most metals/metalloids concentrations were below respective guidelines, except for zinc. However, zinc concentrations were above guideline levels regardless of species and site.

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APPENDIX A. METHODS



OVERVIEW

The methods detailed below are based on those stipulated in the SAQP (Epic Environmental, 2022).

HABITAT

Habitat characteristics at sites within riverine habitats (watercourses) were recorded via the use of the Queensland AUSRIVAS River Bioassessment field sheets. Any notable site characteristics and features were recorded and accompanied by photos. A brief site summary was compiled that included notes on bed and bank stability, riparian coverage, substrate coverage, shading and macro and micro-habitat features. For riverine environments, River Bioassessment Program scores (bio-assessment scores; out of 135) were calculated for all sites based on nine AUSRIVAS categories, including: habitat availability (pool/riffle, run/bend ratio); bank stability; streamside cover; bed substrate composition and embeddedness; channel alteration; and presence of scouring and/or deposition. From these scores, an aquatic habitat condition rating was calculated and categorised into: Poor, Fair, Good or Excellent habitat conditions.

A number of surveyed sites were also located with lacustrine habitats. The AquaBAMM method used to score wetlands and riverine systems in Australia is used to assess natural and near natural wetlands and cannot be applied to Lake Callide or Kroombit Dam. Additionally, the assessment focuses on conservation significant species presence and priority species in its scoring rather than the assessment of macro and microhabitat variables and items affecting such variables (i.e. deposition, scouring, etc.). Many defined guidelines for such assessments are drafted overseas but assess similar variables to AquaBAMM. In order to maintain consistency with AUSRIVAS habitat condition assessments, AUSRIVAS Physical Assessment Protocol scores was adapted by Hydrobiology for the assessment of lacustrine habitats. As with riverine sites, all sites were scored and classified as being in poor, fair, good or excellent condition however the scores required for each of these classifications differed to those defined for riverine sites.

WATER QUALITY

DATA COLLECTION AND PROCESSING

Physiochemical parameters were not measured in-situ at the time of the survey as this method was not required by the SAQP (Epic Environmental, 2022) for biota sampling.

The latest in-situ water quality data was provided by the client for the water monitoring points closest to each survey site. Data was as recent as February 2023 but dates back to July 2022. Note that it was provided for background/general consideration.

GUIDELINE COMPARISON

Water quality data provided by the client was compared against the WQO's defined for the Callide Creek catchment (DEHP, 2011) and against ANZG/ANZEEC guideline values where relevant (ANZG, 2018).

MACROINVERTEBRATES

SAMPLE COLLECTION AND PROCESSING

Macroinvertebrate sampling was undertaken in accordance with AUSRIVAS protocols for Queensland streams (DNRM, 2001) and more recent macroinvertebrate sampling manuals (DES, 2018). In order to target macroinvertebrates occurring in different freshwater habitats and to assess varying impact processes, both kick (pool/bed habitat) and sweep (edge habitat) samples were collected from each site. Collected samples were live-picked and returned to the laboratory for identification to family and sub-family (chironomids only) level, where possible. Importantly, macroinvertebrate sampling, processing, identification and enumeration was undertaken by AUSRIVAS accredited scientists.

DATA ANALYSIS

GUIDELINE COMPARISONS

Collected macroinvertebrate data were used to calculate several diversity indices including:

- Taxonomic richness (the number of individual taxa recorded at each site);
- Total abundance (the number of macroinvertebrates at each site);
- Tolerant taxa (the percentage of tolerant taxa in represented within each sites overall assemblage);
- Plecoptera, Ephemeroptera and Trichoptera (PET) richness (the number of pollution-sensitive taxa at each site); and
- SIGNAL (the condition score calculated for each site based on present macroinvertebrates and their associated sensitivity grades).

Calculated diversity index values were compared to relevant biological quality objectives (BQO) for edge and composite (includes run, riffle, pools) habitats defined for the Callide Creek Catchment, which for all catchments in the Fitzroy basin are based on the 20:80 percentile values defined for the central coast region (EHP, 2009).

AUSRIVAS PREDICTIVE MODELLING

The macroinvertebrate and predictor variable (habitat) data were analysed using the AUSRIVAS macroinvertebrate predictive modelling program, version 3.2.2 (Coyush et al., 2000). Based on the period of sampling and the habitat in which macroinvertebrates were collected, the autumn (post-wet) edge and pool predictive models were used to provide an indication of water quality and/or habitat condition.

AUSRIVAS predictive model produces various outputs, of which the most valuable for interpretation is the observed to expected ratio (OE50) score. It provides a measure of biological impairment at each site (Coyush et al., 2000). The OE50 scores are assigned to band sections provided by the model, ranging from Band X (better than AUSRIVAS database reference condition) to Band D (extremely impaired).

FUNCTIONAL FEEDING GUILDS

Macroinvertebrates are often grouped into functional feeding guilds (FFGs) for ease of conceptualisation. FFGs classification of aquatic organisms enhances the knowledge of trophic dynamics in streams by simplifying the benthic community into FFGs. The pattern of FFG distribution has been related to the environmental gradient in the river (River Continuum Concept – Vannote et al., 1980) and can therefore provide an indication of the health of a river system (i.e. should there be changes to the expected distribution of guilds).

Functional feeding guilds were assigned to each taxa recorded in edge and bed habitat, graphed and compared visually among sites and habitats.

FISH, REPTILES AND MACROCRUSTACEANS

DATA COLLECTION AND PROCESSING

During the sampling event, a range of passive (fyke nets, pyramid and box traps) and active (electrofishing) survey methods were utilised. The aforementioned techniques are suitable and commonly used apparatus for the survey of fish (small and large bodies species) and aquatic reptiles. The below methods are also efficient methods for the capture of macrocrustaceans, and while not specifically used for this reason, were commonly caught as by-catch.

All individuals of native species not required for tissue analysis were released after identification and measurement near to where they were captured. All exotic and voucher specimens were euthanised via a lethal dose of Aqui-S® solution in accordance with Hydrobiology's Animal Ethics approval. Exotics were disposed of in accordance with current State legislative requirements.

Fish and aquatic reptile surveys were undertaken in accordance with relevant permits, including:

- Department of Agriculture and Fisheries (DAF) Animal Ethics Approval - #CA 2021/02/1462;
- General Fisheries Permit - #206951;
- Research permit issued under the provisions of the *Nature Conservation Act 1992*- # P-PTUKI-100325946; and
- Research permit issued under the provisions of the *Forestry Act 1959*- # P-PTC-100325951.

FYKE NETS

At each site with sufficient water, a large dual wing fyke and a smaller single wing fyke were deployed with entrances facing downstream where possible. The large fyke had two 5.1 m wings, a mouth 1m wide and a tunnel 3.2m long. The smaller fyke had a single 4.8 m wing, a mouth 0.6 m wide and a tunnel 3.2 m long. The mesh sizes of the large and small fyke nets were 5 and 3 mm, respectively. A float was placed in the cod end of each fyke net to provide an air space for air breathing fauna (turtles, freshwater snakes etc). Fyke nets were set either in the morning or afternoon following site habitat assessment, electrofishing and macroinvertebrate sampling and processing. Fyke nets were cleared after night deployment.

BOX TRAPS

At each site a total of five box traps were deployed around available microhabitat (i.e. around woody debris, amongst rushes, large rocks/rubble). Each trap was baited with cat biscuits. Box traps were set either in the morning or afternoon following site habitat assessment, electrofishing and macroinvertebrate sampling and processing. Box traps were cleared after night deployment.

PYRAMID TRAPS

Three pyramid traps were deployed at each site amongst suitable microhabitat (i.e. around woody debris, amongst rushes, large rocks/rubble). Traps were baited with cat food, cow organs and fruits). Pyramid traps were set either in the morning or afternoon following site habitat assessment, electrofishing and macroinvertebrate sampling and processing. Pyramid traps were cleared after night deployment.

ELECTROFISHING

Creek Sites

Backpack electrofishing was employed at creek sites in wadable areas using a Smith-root APEX backpack electrofisher fitted with a 28 cm anode ring and a tightly covered dip net (10 mm stretched mesh). Both frequency (300 Hz) and duty cycle (~50%) was fixed to maintain a constant pulse width, with voltage varying according to conductivity levels. Sampling effort aimed to be consistent across habitats, with approximately 600 seconds 'on time' at sites. Due to the conductivity of site AB11 backpack electrofishing could not be performed.

Lake Sites

Boat electrofishing was conducted at Lake Callide sites (AB2 and AB3) and at Lake Kroombit (AB9). Boat electrofishing was undertaken via the use of a 5 m boat fitted with a 5 KVA generator and Smith–Root control box. Each standard boat electrofishing shot was completed of power–on time of approximately 600 seconds (± 5%). Applied voltage varied according to the prevailing conductivity and temperature conditions. Stunned fish were blind sweep-netted from the water with a 3 mm open–mesh dip net fitted to a fibreglass pole.

VERTEBRATE PROCESSING

The following vertebrate processing methods were employed at all sites:

- Fish, macrocrustaceans, and turtles were identified to species level and enumerated;
- Carapace length was taken for each macrocrustacean collected until 20 individuals of the species were recorded for the particular site and capture method. Following this, the individuals would be counted; and
- Each fish specimen was measured for total length until 20 individuals of the species were recorded for the particular site and capture method. Following this, the individuals were counted.

DATA ANALYSIS

Total species richness and abundances was summarised for each class across all sites.

Diversity and composition of sites along the main trunk of Callide Creek were compared against fish WQO values defined by DEHP (2011) OE50 values were calculated by dividing the number of native fish species at each site by 14 to determine a ratio value. The value of 14 was defined within the WQO as the expected number of native species along Callide Creek's main trunk, and the WQO defined the OE50 ratio values as ≥1. The WQO also specified values for exotic fish species, where the number of alien fish present could not exceed 2 exotic species, with *Carassius austratus* and *Gambusia holbrooki* both previously identified with Callide Creek main trunk.

BIOTA TISSUE ANALYSIS

This study aimed to quantify levels of PFAS, metals/metalloids and fluoride in aquatic organisms relevant to the assessment of risks to human and ecological receptors. Therefore, different species/tissues were be targeted as defined by the SAQP (Epic Environmental, 2022). A range of species were considered for sampling, though the capture of target species was limited by what is caught on each sampling day. Sampling the same species at each site which provided for a more robust dataset and allowed for comparison among treatments/sites.

The following considerations were made:

- If possible, the same species were collected across sites for comparison; and
- If the primary or secondary target species were not present at sites additional species representing the same functional feeding group (i.e. predator, planktivore, omnivores, etc.) were selected.

SAMPLE SIZE AND PROCESSING

The edible portions (fillet/muscle tissue for fish or abdomen flesh for macrocrustaceans) of five or more individuals were combined and processed (composited) for each human health target species at each site where possible. The rest of the body of selected individuals from three species were processed separately to investigate any variability of contaminant concentration within different body parts. This included samples from:

- Yellowbelly (*M. ambigua*);
- Barramundi (*L. calcarifer*); and
- Crayfish (*C. quadricarinatus*).

The whole bodies of 5 or more individual ecological health target species were combined and processed (composited) at each site where possible.

All dissection, compositing and homogenisation of biota samples were conducted at the primary laboratory to reduce potential contamination in the field.

LABORATORY METHODOLOGIES

Australian Laboratory Services (ALS) was selected as the primary laboratory to perform sample analysis and Eurofins Environmental Testing Australia Pty Ltd (Eurofins) were selected to conduct triplicate analysis. National Measurement Institute (NMI) were selected to conduct additional analysis for lithium, thorium and total fluoride on each sample and for these analyses represent the primary laboratory.

The analytical procedures used by the laboratories selected are in accordance with established internationally recognised procedures such as those published by the United States Environmental Protection Agency (USEPA), American Public Health Association (APHA) and relevant Australian Standards/New Zealand Standards (AS/NZS).

The following PFAS constituents were analysed:

- Perfluorobutane sulfonic acid <0.02(PFBS)
- Perfluoropentane sulfonic acid (PFPeS)
- Perfluorohexane sulfonic acid (PFHxS)
- Perfluoroheptane sulfonic acid (PFHpS)
- Perfluorooctane sulfonic acid (PFOS, both linear and branched)
- Perfluorodecane sulfonic acid (PFDS)
- Perfluorobutanoic acid (PFBA)
- Perfluoropentanoic acid (PFPeA)
- Perfluorohexanoic acid (PFHxA)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorooctanoic acid (PFOA)
- Perfluorononanoic acid (PFNA)
- Perfluorodecanoic acid (PFDA)
- Perfluoroundecanoic acid (PFUnDA)
- Perfluorododecanoic acid (PFDoDA)
- Perfluorotridecanoic acid (PFTrDA)
- Perfluorotetradecanoic acid (PFTeDA)
- Perfluorooctane sulfonamide (FOSA)

- N-Methyl perfluorooctane sulfonamide (MeFOSA)
- N-Ethyl perfluorooctane sulfonamide (EtFOSA)
- N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)
- N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
- N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)
- N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)
- 4:2 Fluorotelomer sulfonic acid (4:2 FTS)
- 6:2 Fluorotelomer sulfonic acid (6:2 FTS)
- 8:2 Fluorotelomer sulfonic acid (8:2 FTS)
- 10:2 Fluorotelomer sulfonic acid (10:2 FTS)

The primary laboratory (ALS) analysed for the following total metals/metalloids:

- Arsenic
- Barium
- Chromium
- Copper
- Molybdenum
- Selenium
- Strontium
- Uranium
- Vanadium
- Zinc
- Boron

Additional metals analysis was requested that could not be completed by the primary laboratory, these being total lithium and total thorium. A sub-sample was therefore provided to the secondary laboratory (NMI) for this analysis where sample volume was sufficient. Sub-samples were prepared and distributed by ALS.

Sub-samples of each sample were provided to the secondary laboratory (NMI) for analysis of total fluoride where sample volume was sufficient. Sub-samples were prepared and distributed by ALS.

QA/QC

Primary samples consisted of tissue removed from multiple individuals (5-10) that were combined and homogenised. A sub-sample was taken from selected (homogenised) samples to provide duplicate and triplicate QA/QC samples. Duplicate and triplicate samples were collected at a rate of one duplicate and one triplicate every ten primary samples. Duplicate samples were analysed by the primary laboratory (ALS) and triplicate samples were analysed by Eurofins. The primary samples and their respective duplicate/triplicate samples are displayed in Table 5-1.

Table 5-1 Primary samples and their respective duplicate/triplicate samples.

Primary sample	Duplicate	Triplicate
AB2-LC-EP	AB2-BC-DU	-
AB3-CS-WB	AB3-CS-DU	-

Primary sample	Duplicate	Triplicate
AB9-NH-EP	AB9-NH-DU	-
AB1-MA-EP	AB1-MA-DU	AB1-MA-TR
AB1-NH-EP	-	AB1-NH-TR

Rinsate water samples were collected each day by rinsing down sampling equipment to check for potential contamination. Each rinsate sample contained water collected from rinsing the measuring board used to measure and weigh each fish/crustacean. Additionally, a sample of dilute Aqui-S was collected and analysed to check if the anaesthetic was a potential source of contaminants. Laboratory QA/QA measures included method blanks, control samples and method spikes. The results of the QA/QC analysis are detailed in (Appendix B).

SCREENING CRITERIA

Human Health

The PFAS National Environmental Management Plan (NEMP, 2020) provides Australian guidance on food consumption screening criteria for PFAS levels relevant to human health. It should be noted that that the food consumption guideline values were based on FSANZ trigger values that consider 100% of total dietary intake (TDI) (NEMP, 2020 Table 5-2). As such, when considering the consumption of seafood only, they may not be protective for people exposed to PFAS from other unaccounted potential pathways. Additional TDI values were then calculated for an average weigh male (70kg) as defined in national guidelines for assessing human health risks from environmental hazards (enHEALTH, 2012). These values were then compared to the levels of PFAS in biota collected in the current study and are displayed in the associated graphs.

Table 5-2 Summary of human health screening criteria, extracted from NEMP (2020)

Exposure scenario	Unit	PFOS + PFHxS	PFOA	Note
Tolerable daily intake (TDI)	µg/kg$_{BW}$/day*	0.02	0.16	These criteria are based on 100 % of total dietary intake (TDI) and may not be protective for people exposed to PFAS from other potential pathways.
Calculated TDI for average 70kg adult (µg/day)	µg/day	1.4	11.2	

* BW stands for body weight

Ecological

All ecological screening values for the protection against bioaccumulation and secondary poisoning available from NEMP (2020) are summarised in Table 5-3.

Table 5-3 Summary of ecological screening criteria, extracted from NEMP (2020).

Exposure scenario	PFOS	PFOA	Note
Mammalian diet (biota ww food)	4.6 µg/kg	Not available	Based on Canadian guidelines for screening of biota (e.g. fish tissue) samples consumed by mammals and/or birds. The value refers to the concentration of PFOS in the aquatic biota food item. It should be noted that data is not based on relevant species; e.g. wetland birds in Australia may have higher risk based on size and consumption rates.
Avian diet (biota ww food)	8.2 µg/kg	Not available	

GENERALLY EXPECTED LEVELS

Results were compared to historical data and against Generally Expected Levels (GELs) for metals/metalloids in fish and crustaceans according to ANZFA (2001) guidelines. GELs provide a benchmark against which to measure contaminant levels in food. The GELs used in the current study are displayed in Table 5-4.

Table 5-4 GELs used in the current study. Units in mg/kg.

Metal	Crustacean GEL	Fish GEL
Copper	20	2
Selenium	1	2
Zinc	40	15

APPENDIX B. QA/QC



OVERVIEW

Sampling and analysis was conducted by appropriately qualified samplers (including fisheries biologists, aquatic ecologists and contamination scientist with over 70 years of collective experience) following methods consistent with national and state guidelines. Sampling of biota for PFAS followed guidelines specific for the collection of seafood (i.e., fish and crustacean) samples for human health risk assessment (Queensland Health, n.d). This includes measures such as:

- Appropriate species selection;
- Differentiating edible portions specific for human consumption;
- Obtaining sufficient sample sizes;
- Minimising contamination in the field by avoiding materials containing PFAS (e.g. clothing, containers, etc.);
- Conducting sample preparation in a laboratory;
- Chilling/freezing samples promptly after collection; and
- Following a defined SAQP.

DUPLICATES

Duplicate samples (collected at a rate of one every ten samples) were collected to assess the precision and repeatability of the primary laboratory. Relative percent differences (RPD) were used to qualify quality control efforts. The duplicates were analysed by the primary laboratory provider (ALS).

The results of the duplicate analysis indicate that all RPDs apart from strontium were below the measurement quality objective (MQO) of ≤50% (Table 5-5). This indicates that there may be decreased precision of the strontium data analysis provided in this report.

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Table 5-5 Duplicate tissue analysis QA/QC results. Shaded cells represent RPD >50%.

Analyte	Units	LOR	AB2 Barramundi	Duplicate	RPD(%)	AB3 Hardyhead	Duplicate	RPD(%)	AB9 Hyrtlii	Duplicate	RPD(%)	AB1 Yellowbelly	Duplicate	RPD(%)
Arsenic	mg/kg	0.05	0.08	0.07	13	0.22	0.24	9	<0.05	<0.05	-	0.06	0.05	18
Barium	mg/kg	0.1	0.1	<0.1	-	2.4	2.8	15	<0.1	0.2	-	<0.1	<0.1	-
Boron	mg/kg	5	<5	<5	-	<5	<5	-	<5	<5	-	<5	<5	-
Chromium	mg/kg	0.05	<0.05	<0.05	-	1.4	1.44	3	0.6	0.55	9	<0.05	<0.05	-
Copper	mg/kg	0.1	0.4	0.3	29	0.6	0.6	0	0.4	0.4	0	0.3	0.3	0
Molybdenum	mg/kg	0.05	<0.05	<0.05	-	0.18	0.2	11	0.07	0.07	0	<0.05	<0.05	-
Selenium	mg/kg	0.05	0.16	0.18	12	0.2	0.21	5	0.14	0.13	7	0.44	0.4	10
Strontium	mg/kg	0.1	1.1	0.8	32	52.1	61.3	16	1	5.9	142	0.5	0.4	22
Uranium	mg/kg	0.01	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.01	<0.01	-
Vanadium	mg/kg	0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-
Zinc	mg/kg	0.5	5.6	4.9	13	53.8	54.3	-1	11.5	15.6	30	10.1	9.3	8
Perfluorobutane sulfonic acid (PFBS)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluorohexane sulfonic acid (PFHxS)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluorooctane sulfonic acid (PFOS) - Linear	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluorooctane sulfonic acid (PFOS) - Branched	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluorooctane sulfonic acid (PFOS)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluorodecane sulfonic acid (PFDS)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
Perfluorobutanoic acid (PFBA)	µg/kg	5	<5	<5	-	<5	<5	-	<5	<5	-	<5	<5	-
Perfluoropentanoic acid (PFPeA)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
Perfluorohexanoic acid (PFHxA)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluoroheptanoic acid (PFHpA)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluorooctanoic acid (PFOA)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluorononanoic acid (PFNA)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluorodecanoic acid (PFDA)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-

Analyte	Units	LOR	AB2 Barramundi	Duplicate	RPD(%)	AB3 Hardyhead	Duplicate	RPD(%)	AB9 Hyrtlii	Duplicate	RPD(%)	AB1 Yellowbelly	Duplicate	RPD(%)
Perfluoroundecanoic acid (PFUnDA)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Perfluorododecanoic acid (PFDoDA)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
Perfluorotridecanoic acid (PFTrDA)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
Perfluorooctane sulfonamide (FOSA)	µg/kg	5	<5	<5	-	<5	<5	-	<5	<5	-	<5	<5	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	5	<5	<5	-	<5	<5	-	<5	<5	-	<5	<5	-
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	2	<2	<2	-	<2	<2	-	<2	<2	-	<2	<2	-
Sum of PFAS	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-
Sum of PFHxS and PFOS	µg/kg	1	<1	<1	-	<1	<1	-	<1	<1	-	<1	<1	-

TRIPLICATES

Triplicate samples (collected at a rate of one every ten primary samples) were collected to assess any lab biases. Relative percent differences (RPD) were used to qualify quality control efforts. The triplicates were analysed by Eurofins.

The results of the triplicates analysis indicate that all RPDs were below the measurement quality objective (MQO) of ≤50% (Table 5-6).

Table 5-6 Triplicate tissue analysis QA/QC results.

Analyte	AB1 Yellowbelly	Triplicate	RPD (%)	AB1 Hyrtlii	Triplicate	RPD (%)
Arsenic	0.06	< 2	-	0.07	< 2	-
Barium	<0.1	< 10	-	<0.1	< 10	-
Boron	<5	< 10	-	<5	< 25	-
Chromium	<0.05	< 5	-	<0.05	< 5	-
Copper	0.3	< 5	-	0.3	< 5	-
Molybdenum	<0.05	< 5	-	<0.05	< 5	-
Selenium	0.44	< 2	-	0.22	< 2	-
Strontium	0.5	< 10	-	0.8	< 10	-
Uranium	<0.01	< 10	-	<0.01	< 10	-
Vanadium	<0.5	< 10	-	<0.5	< 10	-
Zinc	10.1	7.8	26	12.4	10	21
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	<2	< 5	-	<2	< 5	-
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	<2	< 5	-	<2	< 5	-
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	<2	< 5	-	<2	< 5	-
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	<2	< 10	-	<2	< 10	-
Perfluorobutanoic acid (PFBA)	<5	< 5	-	<5	< 5	-
Perfluorodecanoic acid (PFDA)	<1	< 5	-	<1	< 5	-
Perfluorododecanoic acid (PFDoDA)	<2	< 5	-	<2	< 5	-
Perfluoroheptanoic acid (PFHpA)	<1	< 5	-	<1	< 5	-
Perfluorohexanoic acid (PFHxA)	<1	< 5	-	<1	< 5	-
Perfluorononanoic acid (PFNA)	<1	< 5	-	<1	< 5	-
Perfluorooctanoic acid (PFOA)	<1	< 5	-	<1	< 5	-
Perfluoropentanoic acid (PFPeA)	<2	< 5	-	<2	< 5	-
Perfluorotetradecanoic acid (PFTeDA)	<2	< 5	-	<2	< 5	-
Perfluorotridecanoic acid (PFTrDA)	<2	< 5	-	<2	< 5	-
Perfluoroundecanoic acid (PFUnDA)	<1	< 5	-	<1	< 5	-
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	<2	< 5	-	<2	< 5	-

Analyte	AB1 Yellowbelly	Triplicate	RPD (%)	AB1 Hyrtlii	Triplicate	RPD (%)
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	<2	< 5	-	<2	< 5	-
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	<2	< 5	-	<2	< 5	-
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	<1	< 10	-	<1	< 10	-
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	<5	< 5	-	<5	< 5	-
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	<1	< 10	-	<1	< 10	-
Perfluorooctane sulfonamide (FOSA)	<5	< 5	-	<5	< 5	-
Perfluorobutanesulfonic acid (PFBS)	<1	< 5	-	<1	< 5	-
Perfluorodecanesulfonic acid (PFDS)	<2	< 5	-	<2	< 5	-
Perfluoroheptanesulfonic acid (PFHpS)	<1	< 5	-	<1	< 5	-
Perfluorohexanesulfonic acid (PFHxS)	<1	< 5	-	<1	< 5	-
Perfluorooctanesulfonic acid (PFOS)	<1	< 5	-	<1	< 5	-
Perfluoropentanesulfonic acid (PFPeS)	<1	< 5	-	<1	< 5	-
Sum (PFHxS + PFOS)*	<1	< 5	-	<1	< 5	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	<1	< 5	-	<1	< 5	-

METHOD BLANK

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination.

All analytes in the method blank samples were below detection indicating that there was no laboratory contamination.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix.

All laboratory control samples were within acceptable limits (70-130% recovery).

MATRIX SPIKES

A matrix spike refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries.

All matrix spike recoveries were within the acceptable limits (70-130%).

RINSATES

All analytes were below detectable levels within rinsate samples and within the dilute Aqui-s sample, indicating no contamination from sampling equipment or chemicals used in fish anesthetisation (Table 5-7).

Table 5-7 Rinsate and dilute Aqui-s QA/QC analysis results.

Analyte	Units	LOR	Rinsate 1 (30/01/2023)	Rinsate 2 (31/01/2023)	Rinsate 3 (1/02/2023)	Rinsate 4 (2/02/2023)	Rinsate 5 (3/02/2023)	Dilute Aqui-s
Arsenic	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Analyte	Units	LOR	Rinsate 1 (30/01/2023)	Rinsate 2 (31/01/2023)	Rinsate 3 (1/02/2023)	Rinsate 4 (2/02/2023)	Rinsate 5 (3/02/2023)	Dilute Aqui-s
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

APPENDIX C. FIELD DATASHEETS



Site number	~~SOS-AB3~~	Site name	
Watercourse		Collector	1000V 120Hz 10% 7A
Date	30/1/23	Project code	

Kept for tissue

Hum
Barred
Redclaw
Golden perch

Eco
Tandanus
Rainbow
Mussel
Yarra pygmy perch
Macrobrachium

Hydrobiology

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Barramundi	Total length (mm)	925	~~900~~	832																		
		Fork length (mm)																					
		weight (g)	10.25	885	6.95																		
2	Longfin	Total length (mm)				442	427	255	546	538													
		Fork length (mm)																					
		weight (g)				186	180	24	~~90~~	440													
3	Bony bream	Total length (mm)	83	72	101	106	76	68	73	86	82	64	97	175	110	300	180	163	86	92	74		+500
		Fork length (mm)																					
		weight (g)	4	2	8	8	4	2	6	4	6	2	10	58	14	34	73	36	10	10	10		
4	Barred grunter	Total length (mm)	82	106	52	62	97	82	108	91													
		Fork length (mm)																					
		weight (g)	6	18	6	6	10	12	22	10													
5	Kreffts	Total length (mm)	1 juvenile																				
		Fork length (mm)	1 adults (see photo?)																				
		weight (g)																					
6	Sleepy cod	Total length (mm)	320	200	125	112	410																
		Fork length (mm)																					
		weight (g)	488	92	40	18	1.3																
7	Mouth almighty	Total length (mm)	61	130	105																		
		Fork length (mm)																					
		weight (g)	4	40	20																		
8	Ely-spotted handy head	Total length (mm)	16	26	32	24	68																
		Fork length (mm)																					
		weight (g)	1	1	1	1	4																
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10	Redclaw	Total length (mm)	48	27																			
		Fork length (mm)	kept	~~kept~~ tissue																			
		weight (g)	16	12																			

Site number	AB3	Site name	
Watercourse		Collector	
Date	31/11/23	Project code	

Traps

Kept. for tissue

Hydrobiology

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Koaro tadpole	Total length (mm)	1	juvenile																			
		Fork length (mm)																					
		weight (g)																					
2	Redclaw	Total length (mm)	57	43	47	32	30	31	31	27													
		Fork length (mm)																					
		weight (g)	120	60	70	20	20	20	20	14													
3	Mouth almighty	Total length (mm)	53	41																			
		Fork length (mm)																					
		weight (g)	4	2																			
4	Banded gourami	Total length (mm)	86																				
		Fork length (mm)																					
		weight (g)	20																				
5		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
6		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
7		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
8		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number	AB2	Site name	
Watercourse		Collector	500V 13A 20% 120HZ
Date	30/1/23	Project code	

Hydrobiology

kept for tissue

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Bostockia porosa Lates Calcarifer	Total length (mm)	860	970																			
		Fork length (mm)																					
		weight (g)	9.500	13000																			
2	Long Tom Strongylura kreffti	Total length (mm)	760	750	675																		
		Fork length (mm)																					
		weight (g)	1166	702	724																		
3	bony bream Nematalosa erebi	Total length (mm)	290	120	115	85	150	110	80	80	90	65	72	110	285	80	95	78	370	145	150	150	+20
		Fork length (mm)																					
		weight (g)	314	350	22	16	30	18	12	12	18	10	10	25	306	30	22	15	660	40	62	54	
4	Fly Specked Hardyhead Craterocephalus stercusmuscarum	Total length (mm)	75	70																			
		Fork length (mm)																					
		weight (g)	4	8																			
5	Mouth Almighty Glossamia aprion	Total length (mm)	100	110	60																		
		Fork length (mm)																					
		weight (g)	20	20	2																		
6	Banded Grunter Amniataba percoides	Total length (mm)	66	122	130	130	90	92	56	63	100												
		Fork length (mm)			115																		
		weight (g)	5	30	35	20	10	14	3	4	34												
7	Eel tail Catfish Tandanus tandanus	Total length (mm)	(172	80	225)	– kept for tissue																	
		Fork length (mm)																					
		weight (g)	66	5	110																		
8	Hypseleotris sp8 spp	Total length (mm)	20																				
		Fork length (mm)																					
		weight (g)	1																				
9	Red claw	Total length (mm)																					
		Fork length (mm)	(28	– kept for tissue																			
		weight (g)	28																				
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number	AB2	Site name	
Watercourse		Collector	
Date	31/2/23	Project code	

* kept for tissue Labelled Glassgrn
** kept for tissue Labelled Redclaw AC5
**** kept for tissue

Hydrobiology

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Traps Barred gnmdy	Total length (mm)	90	82																			
		Fork length (mm)																					
		weight (g)	12	10																			
2	1-wing gsfc Krygsts	Total length (mm)	IIII	IIII I	adults, juvenile																		
		Fork length (mm)	11																				
		weight (g)																					
3	Barred gfmdy	Total length (mm)	100	47	70	19	63	71	88	98	92	98	86	118	135	72	64	112	114	112	76	84	
		Fork length (mm)																					
		weight (g)	24	10	15	20	10	10	10	20	20	20	10	10	50	10	10	24	18	25	4	10	
4	Ambassis *	Total length (mm)	26	54	57	56	56																
		Fork length (mm)																					
		weight (g)	2	5	5	6	6																
5	Marah dmyby	Total length (mm)	64	65	52	56	52	43	64														
		Fork length (mm)																					
		weight (g)	4	3	3	3	3	3	5														
6	Hardyhead ****	Total length (mm)	56																				
		Fork length (mm)																					
		weight (g)	4																				
7	Hyrtlii	Total length (mm)	220																				
		Fork length (mm)																					
		weight (g)	88						kept														
8	Redclaw **	Total length (mm)	26	38	48	27	28	29	34	29	25												
		Fork length (mm)																					
		weight (g)	14	40	52	22	10	16	110	24	12												
9	Mosquito fish	Total length (mm)	20	21																			
		Fork length (mm)																					
		weight (g)																					
10	Saratoga observed	Total length (mm)	≥ 700																				
		Fork length (mm)																					
		weight (g)																					

Site number		Site name	
Watercourse	AB3	Collector	
Date	31/2/23	Project code	

Hydrobiology

Small 1-way sytke

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	trigger tubble	Total length (mm)					1 adults																	
		Fork length (mm)					juveniles																	
		weight (g)																					
2	Banded grunter	Total length (mm)	112	115	104	105	95	53	93	107	22	90	46	45	75	48							
		Fork length (mm)																					
		weight (g)	20	24	18	18	14	2	10	20	10	14	2	2	10	2							
3	Bony bream	Total length (mm)	102																				
		Fork length (mm)																					
		weight (g)	10																				
4	Mouth almighty	Total length (mm)	40	56																			
		Fork length (mm)																					
		weight (g)	10	12																			
5	Fly-specked hardyhead	Total length (mm)	35	28	30	18	31	22	21	28	22	35	32	25	21	24	28	21	25	29	21	36	
		Fork length (mm)																					
		weight (g)	4	2	2	1	2	2	2	2	2	4	4	2	2	2	2	2	2	2	2	4	
6		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
7	Redclaw	Total length (mm)	34	43	23	36	35	34	28	32	35	29	29										
		Fork length (mm)																					
		weight (g)	20	57	4	40	30	28	10	36	38	48	20										
8	sleepy cod	Total length (mm)	46																				
		Fork length (mm)																					
		weight (g)	1																				
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number	AB3	Site name	
Watercourse		Collector	
Date	31/1/23	Project code	

* 50 taken for tissue (labelled as kanyuiensis)
** 50 taken for tissue (labelled as glassgish)
Large 2-wing
*** Tissue ① to ALS ② to NMi

Hydrobiology

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	kreyglis	Total length (mm)	|||	|| adult																	
		Fork length (mm)	|||	|| juvenile																	
		weight (g)	||																			
2	Long-nosed turtle	Total length (mm)	1		adult																		
		Fork length (mm)																					
		weight (g)																					
3	Bony bream	Total length (mm)	370																				
		Fork length (mm)																					
		weight (g)	650																				
4	fly-spotted hardyhead*	Total length (mm)	29	27	18	30	31	35	36	35	31	41	36	47	28	32	54	78	71	34	26	37	+42
		Fork length (mm)																					+52
		weight (g)	2	2	1	2	2	2	2	2	2	4	2	4	2	2	4	4	4	?	2	4	+200
5	Banded grunter	Total length (mm)	196	82	65	78	93	120	127	126	115	78	55	51	132	97	67	153	46				+400
		Fork length (mm)																					
		weight (g)	50	12	10	104	10	28	35	28	24	10	6	6	55	30	10	64	45				
6	Ambassis** agassizi	Total length (mm)	26	48	51	32	29	30	27	28	31	54	50	48	36	31	26	23	32	31	37	30	+12
		Fork length (mm)																					+50
		weight (g)	2	1	4	2	2	2	2	2	2	4	4	4	2	2	2	2	2	2	2	2	+100
7	Mouth almighty	Total length (mm)	27	45	60	51	67	64	57	42	75	64	47	40									
		Fork length (mm)																					
		weight (g)	2	4	10	10	10	10	5	5	10	10	5	4									
8	Macrobrachium sp.***	Total length (mm)	5	5	5	5	5	5	5	5	5	5	10	10	10	10	10	10	10	10	10	10	
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
9	Leptocarid prawn	Total length (mm)	26	14																			
		Fork length (mm)																					
		weight (g)	12	?																			
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number		Site name	
Watercourse	AB2	Collector	
Date	31/5/23	Project code	

* kept for tissue (~20)

** kept for tissue

Hydrobiology

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	[illegible] bream	Total length (mm)	36	46	83	104	34																
		Fork length (mm)																					
		weight (g)	2	5	10	10	2																
2	Hardyhead *	Total length (mm)	41	38	27	42	36	34	44	38	44	41	37	36	32	35	47	43	35	37	38	36	+160
		Fork length (mm)																					+300
		weight (g)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
3	Glassgum	Total length (mm)	28	30	24	32	21	28	24	52	36	31	33	28	31	25	24	30	32	26	27	33	+ 200
		Fork length (mm)																					
		weight (g)	2	2	2	2	2	2	2	4	2	2	2	2	2	2	2	2	2	2	2	2	
4	freshwater turtle	Total length (mm)	###	1 adult																			
		Fork length (mm)	1	Juvenile																			
		weight (g)																					
5	Mouth almighty	Total length (mm)	61	37	62	96	71	68	53	62	112	67	60	62	65	47	62	64					
		Fork length (mm)																					
		weight (g)	10	5	10	10	10	16	10	10	20	10	10	10	10	10	10	10					
6	Barred grunter	Total length (mm)	116	110	90	88	52	57	62	114	56												
		Fork length (mm)																					
		weight (g)	50	50	15	12	5	5	5	30	18												
7	Redclaw	Total length (mm)	34	45																			
		Fork length (mm)																					
		weight (g)	35	78																			
8	Macrobrachium **	Total length (mm)	5	5																			
		Fork length (mm)																					
		weight (g)	1	1																			
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Hydrobiology

Site number	AB9	Site name	
Watercourse		Collector	
Date	1/2/23	Project code	

1 - mm fyke

kept for lab (YS)

kept for lab

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Hyalii	Total length (mm)	147	149	143	144	168	167															
		Fork length (mm)																					
		weight (g)	24	26	72	38	56	52															
2	Koggis	Total length (mm)	25	adults																			
		Fork length (mm)																					
		weight (g)																					
3	Sawshell (dust plate	Total length (mm)	2	adults																			
		Fork length (mm)																					
		weight (g)																					
4	Large Sofke Hypselodoris	Total length (mm)	47	28	36	47	49	43															
		Fork length (mm)																					
		weight (g)	2	1	2	2	2	2															
5	Rainbow	Total length (mm)	83	66	67	43	37	46	62	90	47	51	55	32	36	49	77	72	80	74	51	34	+2 +4+5
		Fork length (mm)																					+3 +6
		weight (g) kept	8	4	8	2	2	7	8	10	2	2	2	2	2	4	4	6	8	4	2	1	
6	Ambassis	Total length (mm)	77	64	50	70	40	72	66	57	53	52	61	68	72	74	77	64	67	67	68	67	+7+4 +5+1
		Fork length (mm)																					
		weight (g)	6	8	6	6	3	6	6	6	6	6	6	6	6	6	6	4	4		4	4	+6
7	Freyta turtle	Total length (mm)	24	adults																			
		Fork length (mm)																					
		weight (g)																					
8	Sawshell turtle	Total length (mm)																					
		Fork length (mm)	1 adult																				
		weight (g)																					
	Hyalii	Total length (mm)	150	115	207	169	162	119	147	142	178	286	206	160	172	146	151	192	180	175	192	129	+16 +4 +7
		Fork length (mm)																					
		weight (g)	24	14	76	49	26	12	30	22	50	232	91	61	44	60	34	34	58	50	60	20	
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number		Site name	
Watercourse	AE9	Collector	
Date	1/2/22	Project code	

Hydrobiology

Large fish cont.

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Spotted perch	Total length (mm)	135	154	174	118	84	96	105	100													
		Fork length (mm)																					
		weight (g)	30	60	92	152	20	17	20	24													
2	Macquaria	Total length (mm)	5	5	5	5	5	5	kept														
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1															
3	Eel-tail Spangled 120cm 500g 1kA 15%	Total length (mm)	88	90	138	68	107	112	184	76	25	127	116	102	93	92	72	102	94	111	108	138	+120
		Fork length (mm)																					
		weight (g)	4	6	34	8	12	22	110	6	165	22	20	10	6	8	5	10	14	34	22	46	
4	Macquaria	Total length (mm)	6	10	-	kept																	
		Fork length (mm)																					
		weight (g)	2	5																			
5	Ranhan	Total length (mm)	62	62	75	77	72	81	82	66	76	81											
		Fork length (mm)																					
		weight (g)	4	2	4	4	4	4	4	2	4	4											
6	Tandanus	Total length (mm)	209	184	192	137	-	kept															
		Fork length (mm)																					
		weight (g)	64	48	88	13																	
7	Anibassis	Total length (mm)	62																				
		Fork length (mm)																					
		weight (g)	2																				
8	Hyrtis	Total length (mm)	229	267	150	120	246	141	130	154	210	170											
		Fork length (mm)																					
		weight (g)	110	190	20	9	100	20	12	20	70	52											
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number		Site name	
Watercourse		Collector	
Date		Project code	

AB8 1/2/23

* 20 kept for tissue.

** 20 kept for tissue

Hydrobiology

small eyte

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Froggfish	Total length (mm)		10	Adult																		
		Fork length (mm)		?	Juvenile																		
		weight (g)																					
2	Hardyhead *	Total length (mm)	34	38	42	37	43	39	39	34	51	33	36	36	42	43	48	34	41	36	28	38	+8 +4
		Fork length (mm)																					
		weight (g)	2	2	3	2	2	2	2	2	4	2	2	2	2	2	2	2	2	2	2	2	
3	Porahilus rentarda	Total length (mm)	100	145																			
		Fork length (mm)																					
		weight (g)	2	20																			
4	Hyattii	Total length (mm)	[31] – kept																				
		Fork length (mm)																					
		weight (g)	14																				
5	Rainbow	Total length (mm)	36 – kept																				
		Fork length (mm)																					
		weight (g)	2																				
6	Longfin eel	Total length (mm)	540																				
		Fork length (mm)																					
		weight (g)	408																				
7	Large eyte Froggfish	Total length (mm)	1 juv																				
		Fork length (mm)	1 adult																				
		weight (g)																					
8	Banded bream	Total length (mm)	230	246																			
		Fork length (mm)																					
		weight (g)	150	120																			
9	Spangled	Total length (mm)	[166]	138	97	132	38	105	200	105	101												
		Fork length (mm)																					
		weight (g)	66	20	12	30	10	30	120														
10	Hardyhead **	Total length (mm)	52	90	41	48	46	38	31	43	72	38	31	31	45	46	48	46	43	36	41	32	+13 +10 +1
		Fork length (mm)	2	2	2	2	2	2	2	2	4	2	2	2	2	2	2	2	2	2	1	2	
		weight (g)																					

Gorne Lagoon

E-gear 1/2/23

BIOLOGICAL RECORD Site name: ABB Waterbody:

Date / /2022

Seq #	Op#	Species Code	Fish #	Length (mm)	Weight (g)	Comments	DNA	Kept
1		Bony bream		326	57		o	o
2				~~57~~			o	o
3				279	50		o	o
4				286	280		o	o
5				304	320		o	o
6				275	290		o	o
7				252	188		o	o
8				164	94		o	o
9				318	410		o	o
D 20				300	400		o	o
1				295	180		o	o
2				312	312		o	o
3				205	270		o	o
4				142	30		o	o
5				146	40		o	o
6		kept		165	50		o	o
7				242	160		o	o
8				216	370		o	o
9				124	16		o	o
D 30				~~192~~	20		o	o
1				242	240		o	o
2				212	116		o	o
3				~~116~~	~~60~~		o	o
4				116	36		o	o
5				116	24		o	o
6				102	10		o	o
7				63	10	+12+16+200	o	o
8							o	o
9							o	o
D 40		Longfin eel		750	200	} kept	o	o
1				1000	350		o	o
2							o	o
3							o	o
4							o	o
5							o	o
6							o	o
7							o	o
8							o	o
9							o	o
D 50							o	o

Seq #	Op#	Species Code	Fish #	Length (mm)	Weight (g)	Comments	DNA	Kept
E 1		Bucket grunter		164	55		o	o
2				92	36		o	o
3				174	96		o	o
4							o	o
5							o	o
6				124	30		o	o
7							o	o
8							o	o
9							o	o
E 10		Hardyhead		69	4		o	o
1				93	4		o	o
2				71	4		o	o
3				75	4	} kept	o	o
4				82	4		o	o
5				77	4		o	o
6							o	o
7							o	o
8							o	o
9		Bumbies		26	2	} kept	o	o
E 20				44	2		o	o
1				48	4		o	o
2							o	o
3							o	o
4							o	o
5							o	o
6							o	o
7		Spangled		152	60		o	o
8				107	18		o	o
9				150	60	} kept	o	o
E 30				172	46		o	o
1				140	40		o	o
2				142	36		o	o
3				116	20		o	o
4				98	10		o	o
5							o	o
6							o	o
7				250			o	o
8		Goldenperch		355	360	- kept	o	o
9							o	o
E 40							o	o

Return to: Conservation Research, GFC Private Mail Bag 2, Grafton, NSW 2460

BIOLOGICAL RECORD **Site name:** **Waterbody:** **Date / /2022**

Seq #	Op#	Species Code	Fish #	Length (mm)	Weight (g)	Comments	DNA	Kept
1							o	o
2							o	o
3							o	o
4							o	o
5							o	o
6							o	o
7							o	o
8							o	o
9							o	o
E 50							o	o
F 1							o	o
2							o	o
3							o	o
4							o	o
5							o	o
6							o	o
7							o	o
8							o	o
9							o	o
F 10							o	o
1							o	o
2							o	o
3							o	o
4							o	o
5							o	o
6							o	o
7							o	o
8							o	o
9							o	o
F 20							o	o
1							o	o
2							o	o
3							o	o
4							o	o
5							o	o
6							o	o
7							o	o
8							o	o
9							o	o
F 30							o	o

Seq #	Op#	Species Code	Fish #	Length (mm)	Weight (g)	Comments	DNA	Kept
1							o	o
2							o	o
3							o	o
4							o	o
5							o	o
6							o	o
7							o	o
8							o	o
9							o	o
F 40							o	o
1							o	o
2							o	o
3							o	o
4							o	o
5							o	o
6							o	o
7							o	o
8							o	o
9							o	o
F 50							o	o
G 1							o	o
2							o	o
3							o	o
4							o	o
5							o	o
6							o	o
7							o	o
8							o	o
9							o	o
G 10							o	o
1							o	o
2							o	o
3							o	o
4							o	o
5							o	o
6							o	o
7							o	o
8							o	o
9							o	o
G 20							o	o

Return to: Conservation Research, GFC Private Mail Bag 2, Grafton, NSW 2460

Site number		Site name	
Watercourse		Collector	
Date	ABS 1/2/23	Project code	

Hydrobiology

Large fyke (continued)

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Rainbow	Total length (mm)	28	32	38	32	36	37	kept														
		Fork length (mm)																					
		weight (g)	2	2	2	2	2	2															
2	Glassgrush	Total length (mm)	48	4[illegible]	46	58	56	49	60	38	42	62	58	40	34	36	43	kept					
		Fork length (mm)																					
		weight (g)	2	2	2	4	4	2	4	2	2	4	4	2	2	2	2						
3	Gambusia	Total length (mm)	36	41																			
		Fork length (mm)																					
		weight (g)	2	2																			
4	Hyrtii	Total length (mm)	142	132	156	130	146	—	kept		136	130	130	13[illegible]	125	128	132	136	121				
		Fork length (mm)																					
		weight (g)	10	10	15	10	10				10	10	10	10	10	10	10	10	10				
5	Porocheilus	Total length (mm)	162																				
		Fork length (mm)																					
		weight (g)	20																				
6	Snake-neck (seephis) → tidal-shelled	Total length (mm)	1	adult																			
		Fork length (mm)	(Chelodina expansa)																				
		weight (g)																					
7	Saw-shelled turtle	Total length (mm)	1	adult																			
		Fork length (mm)																					
		weight (g)																					
8	Trap: Hardyhead	Total length (mm)	25	28	31	28	31																
		Fork length (mm)																					
		weight (g)	1	2	2	2	2																
9	Hypseleotris	Total length (mm)	16	18	20	18	20	21															
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1															
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Hydrobiology

Site number		Site name	
Watercourse	AB4	Collector	
Date	2/2/23	Project code	

Traps / kept

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Mayfly	Total length (mm)	61	55	41	36	21	29															
		Fork length (mm)																					
		weight (g)	4	4	2	2	1	1															
2	Freshfly	Total length (mm)	2 x adults																				
		Fork length (mm)																					
		weight (g)																					
3	Hydroptilidae	Total length (mm)	17	25	26	27	26																
		Fork length (mm)																					
		weight (g)	1	1	1	1	1																
4	Small fly + Freshfly	Total length (mm)	6	adults																			
		Fork length (mm)																					
		weight (g)																					
5	Algidae	Total length (mm)	11	11	kept																		
		Fork length (mm)																					
		weight (g)	1	1		kept																	
6	Hydroptilidae	Total length (mm)	32	18																			
		Fork length (mm)																					
		weight (g)	1	1																			
7		Total length (mm)	4																				
		Fork length (mm)																					
		weight (g)																					
8		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number		Site name	
Watercourse		Collector	
Date	APL4	Project code	2/2/23

Hydrobiology

Lower cut (

* 1-A 10
** Kept 20

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Tandanus	Total length (mm)	445	- Kept																			
		Fork length (mm)																					
		weight (g)	1195																				
2	Potamididae	Total length (mm)		76	- Kept																		
		Fork length (mm)																					
		weight (g)		4																			
3	Hyridella depressa **	Total length (mm)	29	26	27	26	30	29	26	26	26	24	29	27	31	25	27	26	27	25	26	24	
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
4	Hyridella hastata *	Total length (mm)	23	40	42	33	26	29	—	—	26	23	21	27			25	25	14	20		22	+20+1
		Fork length (mm)																					
		weight (g)	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	+1
5	Margaritifera	Total length (mm)	54	51	27	46	- Kept																
		Fork length (mm)																					
		weight (g)	4	4	1	2																	
6	Velesunio	Total length (mm)		32	28	21	20	24	35	27			31	36	26			26		27	- Kept		
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1			
7	Notopala sublinata	Total length (mm)	31	2		26	22	26	20	21				34	26	27	14						
		Fork length (mm)																					
		weight (g)	2	1		2	2	5	0	5	2	2	2	4	3	2	2						
8	Corbicula	Total length (mm)	21	19																			
		Fork length (mm)																					
		weight (g)	1	1																			
9	Glyphyalinia	Total length (mm)	17	→	Kept																		
		Fork length (mm)																					
		weight (g)	8																				
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Hydrobiology

Site number		Site name	
Watercourse		Collector	
Date	ADL · 2/2/23	Project code	

E-fish 500s 100v 10 : 50 Hz → Not rolling high → macrophytes absorbing any?

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Gammarus	Total length (mm)	18	19	29	28																	
		Fork length (mm)																					
		weight (g)	1	1	1	1																	
2	Hyaleella	Total length (mm)	20	21	26																		
		Fork length (mm)																					
		weight (g)	2	1	1																		
3	Alyidae	Total length (mm)	[illegible]	1	1	] Kept																	
		Fork length (mm)																					
		weight (g)	1	1	1																		
4		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
5		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
6		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
7		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
8		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number		Site name	
Watercourse		Collector	
Date	AB5 11:30 2/2	Project code	

Hydrobiology

* kept 60

Traps

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Gambusia *	Total length (mm)	23	28	35	26	31	34	33	36	30	23	26	26	32	22	24	35	26	28	27	26	+5
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
2	Mogurnda	Total length (mm)	[68	50	47	58]	- kept																
		Fork length (mm)																					
		weight (g)	6	2	2	2																	
3	Large cyfe Gambusia	Total length (mm)	28	24	21	27	24	25	27	21	26	31	26	22	21	26	18	22	26	21	27	28	+6+5 +14 +16
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
4	Porochelus	Total length (mm)	[72	73	82	72	78	69	76	80	74]	- kept		78	71	86	64	72	80				
		Fork length (mm)																					
		weight (g)	2	2	2	2	2	2	2	2	2			2	2	2	2	2	2				
5	Mogurnda	Total length (mm)	[34	75	36	55	28	53	30	73	27	46	32	33	32	32	31						
		Fork length (mm)									kept												
		weight (g)	4	6	4	4	2	4	4	6	2	4	4	4	2	2	2						
6	Kyeyst	Total length (mm)	2 x adults																				
		Fork length (mm)																					
		weight (g)																					
7	Small cyfe Ambassis	Total length (mm)	[41]	- kept																			
		Fork length (mm)																					
		weight (g)	2																				
8	Kreyfis	Total length (mm)	1 adult																				
		Fork length (mm)																					
		weight (g)	1 juvenile																				
9	Mogurnda	Total length (mm)	31	46	28	37	33	32	33	56	29	34	57	24	30	32	35	65					
		Fork length (mm)																					
		weight (g)	2	2	2	2	2	2	2	4	2	2	4	2	2	2	2	4					
10	Gambusia	Total length (mm)	24	32	28	24	24	22	29	36	28	27	26	25	35	31							
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1	1	1	1	1							

Site number		Site name	
Watercourse		Collector	
Date		Project code	

Hydrobiology

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Poecilia	Total length (mm)	78	75	65																		
		Fork length (mm)																					
		weight (g)	4	4	4																		
2	Hoplo E-gib Gambusia	Total length (mm)	21	18	25	24	25	28	27														
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1														
3		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
4		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
5		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
6		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
7		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
8		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number		Site name	
Watercourse	AB7	Collector	
Date	3/2/22	Project code	

Hydrobiology

Traps

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Mogurnda	Total length (mm)	32	28	kept																		
		Fork length (mm)																					
		weight (g)	1	1																			
2	Gambusia	Total length (mm)	26	21	kept																		
		Fork length (mm)																					
		weight (g)	1	1																			
3	Hypseleotris	Total length (mm)	26	19	kept																		
		Fork length (mm)																					
		weight (g)	1	1																			
4	Atyidae	Total length (mm)	2	2	kept																		
		Fork length (mm)																					
		weight (g)	1	1																			
5	Large Sufke Broad-skull snake-neck	Total length (mm)	1	adult																			
		Fork length (mm)																					
		weight (g)																					
6	Rainbow - kept	Total length (mm)	26	36	32	29	33	27	34	31	38	32	30	37	32	38	41	34	26	28	29	27	+24 +2 +6 +34 +25
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
7	Gambusia - All kept	Total length (mm)	30	30	30	26	23	35	23	26	29	28	32	34	35	26	32	30	30	27	33	21	
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
8	Hypseleotris - All kept	Total length (mm)	33	29	27	28	38	36	36	31	28	34	28	33	27	30	29	29	28	31	31	36	+14 +10 +25 +30
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
9	Ambassis All kept	Total length (mm)	26	24	30	26	29	26															
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1															
10	Hardyhead - kept	Total length (mm)	26																				
		Fork length (mm)																					
		weight (g)	1																				

Site number		Site name	
Watercourse		Collector	
Date		Project code	

Hydrobiology

* Kapl

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	[Mojarrita — All kept]	Total length (mm)	32	26	26	22	32	29	28	32	28	57	56	26	21	26	22	27	29	31			
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1			
2	Small size Mojarrita	Total length (mm)	27	26	32																		
		Fork length (mm)																					
		weight (g)	1	1	1																		
3	Rainbow	Total length (mm)	30	28	26	31	32	28	25														
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1														
4	Gambusia	Total length (mm)	26	28	21	27	22	26	29	27	24	32	28	29	27	35	28	31	26	26	30	21	+4 +0
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
5	Hyposoleadus	Total length (mm)	23	38	24																		
		Fork length (mm)																					
		weight (g)	1	1	1																		
6	190 Fish 406 Rainbow	Total length (mm)	34	32	38																		
		Fork length (mm)																					
		weight (g)	1	1	1																		
7	Gambusia	Total length (mm)	27	27	23	26	35	27	28	19	25	21	27	28	27	23	32	29					
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
8	Hyposoleadus	Total length (mm)	20																				
		Fork length (mm)																					
		weight (g)																					
9	Atyidae *	Total length (mm)	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number		Site name	
Watercourse		Collector	
Date	AB6 3/2/22	Project code	

Hydrobiology

* Key

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Traps → No fish	Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
2	1 - long fin Gambusia	Total length (mm)	36	34	35	26	31	27	26	17	23	17	- Kept										
		Fork length (mm)																					
		weight (g)	1	1	1	1	1	1	1	1	1	1											
3	2 - long fin Fingerlings	Total length (mm)	1	multi*																			
		Fork length (mm)																					
		weight (g)																					
4	Gambusia *	Total length (mm)	34	35	1 - Kept																		
		Fork length (mm)																					
		weight (g)	1	1																			
5	E-fish 300s No fish	Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
6		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
7		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
8		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number	AK1	Site name	
Watercourse		Collector	
Date	4/2/22	Project code	

Hydrobiology

#	Lowspecies ft..	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Kreeft	Total length (mm)	28	adults +																			
		Fork length (mm)																					
		weight (g)	2	Juveniles +																			
2	Broad-shell Long neck turtle	Total length (mm)	1	Juvenile																			
		Fork length (mm)																					
		weight (g)																					
3	Sawshell	Total length (mm)	1	Adult																			
		Fork length (mm)																					
		weight (g)																					
4	Trap Redclaw	Total length (mm)			[27]	-	Kapl.																
		Fork length (mm)																					
		weight (g)	-		14																		
5	Hyposlecticus	Total length (mm)			21																		
		Fork length (mm)																					
		weight (g)			1																		
6	Glassfish	Total length (mm)			31	32	29																
		Fork length (mm)																					
		weight (g)			1	1	1																
7		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
8		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number		Site name	
Watercourse		Collector	
Date		Project code	

Hydrobiology

AB)

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Lamp-sucker / Bony bream	Total length (mm)	[214	155	126	78	210	162	156	138	150]	– kept			102	134	190	170	102				
		Fork length (mm)																					
		weight (g)	100	36	36	4	108	110	40	40	30				5	28	80	68	5				
2	Tandanus	Total length (mm)	[452]	– kept																			
		Fork length (mm)																					
		weight (g)	1204																				
3	Mouth almighty	Total length (mm)	[97	96	104	80	100]	– kept															
		Fork length (mm)																					
		weight (g)	12	12	16	10	50																
4	Rainbow	Total length (mm)	[78]	– kept																			
		Fork length (mm)																					
		weight (g)	4																				
5	Hardyhead	Total length (mm)	[50	45	51	58	54	63	52	51	48	52	56	48	62	61]	– kept						
		Fork length (mm)																					
		weight (g)	4	2	4	4	4	4	4	4	2	4	4	2	4	4							
6	Glassgoby	Total length (mm)	[33	47	34	33	46	31	51	57	26	29	53	26	32]	kept							
		Fork length (mm)																					
		weight (g)	1	2	1	1	2	1	2	2	1	1	2	1	1								
7	Roosheidus	Total length (mm)	[127]	– kept																			
		Fork length (mm)																					
		weight (g)	16																				
8	flyblitz	Total length (mm)	[292	270	298	120	194	252]	182	135	186	126	110	[324]	274	308	223	165	219	228	202	178	+2
		Fork length (mm)																					
		weight (g)	200	160	260	26	40	160	40	25	40	25	15	260	160	240	90	35	90	120	50	36	
9	Bony bream	Total length (mm)	146																				
		Fork length (mm)																					
		weight (g)	20																				
10	Macrobrachium	Total length (mm)	[8]	kept																			
		Fork length (mm)																					
		weight (g)	1																				

Site number		Site name	
Watercourse		Collector	
Date		Project code	

Hydrobiology

Small eytes

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Eastern long-nosed (dark lines)	Total length (mm)	1	adult																			
		Fork length (mm)																					
		weight (g)																					
2	Redclaw	Total length (mm)	28																				- Kept
		Fork length (mm)																					
		weight (g)	2																				
3	Rainbow	Total length (mm)		Small juv																			
		Fork length (mm)																					
		weight (g)		Juveniles																			
4	Glassy	Total length (mm)	33	34	31																		- Kept
		Fork length (mm)																					
		weight (g)	2	2	2																		
5	Flyspeck	Total length (mm)	62	91	58	60	53	31	34	33	26	26	28	34	27	32	57	33	16	31	31	38	+ 5
		Fork length (mm)																					
		weight (g)	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	
6	Hypseleotris	Total length (mm)	28	21	23	32	28																- Kept
		Fork length (mm)																					
		weight (g)	1	1	1	1	1																
7	Rainbowfish	Total length (mm)	128																				
		Fork length (mm)																					
		weight (g)	22																				
8		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

Site number		Site name	
Watercourse	AB1	Collector	
Date	4/2/2[illegible]	Project code	

Hydrobiology

E-fish 600s

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	Brown bream	Total length (mm)	160	106	226	256	120	206	62	178	137	154	250	186	112	215	120						
		Fork length (mm)																					
		weight (g)	50	12	178	184	19	92	40	60	32	54	180	60	24	185	25						
2	Rainbow	Total length (mm)	97	74	76	92	72	63	65	92	83	79	123	86	72							78	+1
		Fork length (mm)																					
		weight (g)	10	4	4	12	4	4	2	6	4	2	4	2	4	4					2	4	
3	Yellowbelly	Total length (mm)	554	kept																			
		Fork length (mm)																					
		weight (g)	3038																				
4	Hybrid	Total length (mm)	98	105	117	121																	
		Fork length (mm)																					
		weight (g)	10	20	20	20																	
5		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
6	Hybrid	Total length (mm)	31	36	41	46	62	48	41														
		Fork length (mm)																					
		weight (g) kept	2	1	1	2	2	2	2														
7	Spangled	Total length (mm)	186	156	118	180	135	112	100	82	125	88	102	162									
		Fork length (mm)																					
		weight (g)	74	62	30	20	40	36	20	6	30	6	18	86									
8	Mogurnda	Total length (mm)	78	kept																			
		Fork length (mm)																					
		weight (g)	6																				
9	Longtom	Total length (mm)	257																				
		Fork length (mm)																					
		weight (g)	30																				
10	Machrobrachium	Total length (mm)	10	kept																			
		Fork length (mm)																					
		weight (g)	2																				

Site number		Site name	
Watercourse		Collector	
Date		Project code	

Hydrobiology

#	Species	Stats	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	count
1	~~Dan~~ granular Barred	Total length (mm)	18	92	80	83	81	81	104	86	95	64	68	71	78	76	65	103	109				
		Fork length (mm)																					
		weight (g)	12	8	6	4		15		12	16	4	4	8	10	12	8	24	24				
2	Mouri	Total length (mm)	80	45																			
		Fork length (mm)																					
		weight (g)	30																				
3	sleepy cod	Total length (mm)	[45]	–	kept																		
		Fork length (mm)	–																				
		weight (g)	1780																				
4	Nanoperca	Total length (mm)	[10	(0)	kept																		
		Fork length (mm)																					
		weight (g)	2	2																			
5	Glassfish	Total length (mm)	[58]	–	kept																		
		Fork length (mm)																					
		weight (g)	4																				
6	Hardyhead	Total length (mm)	46	62	48	41																	
		Fork length (mm)																					
		weight (g)	1	2	1	1																	
7	Redclaw	Total length (mm)	24	22																			
		Fork length (mm)																					
		weight (g)	16	12																			
observed 8	White-throated turtle	Total length (mm)	1	adult																			
		Fork length (mm)																					
		weight (g)																					
9		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					
10		Total length (mm)																					
		Fork length (mm)																					
		weight (g)																					

REACH OBSERVATIONS (of 100 m stream length)

Site Details

Site Number	AB3
Watercourse	
Date (DD/MM/YYYY)	30/1/23
Time (24 hrs)	12:30

Site Name	
Collector (initials):	Project Code:
Drone footage time:	length:

Observations

Left Bank land use: cleared/grazing	Algae on substrate % cover: 30
Left Bank erosion (%): 0	Algae in water column % cover: 20
Right Bank land use: cleared/grazing	Flow level: ☑ None ☐ Low ☐ Moderate ☐ High ☐ Flood
Right Bank erosion %: 0	Local catchment erosion %: —
Point Source Discharges ☐ yes ☑ no	Sediment Odour ☐ yes ☑ no, Specify .....
Sediment Deposits ☑ None ☐ Sand ☐ Silt	Water Odour ☐ yes ☑ no, Specify .....
Bars (bed surface protruding from normal water level) %: 0	

Macrohabitat

Cover	Value (%)
Riffle (%)	—
Run (%)	—
Pool (rocky) (%)	—
Pool (sandy/silt) (%)	100
Dry (%)	—

Microhabitat

Cover	Value (%)
LWD (>15 cm dia)	0
SWD (<15 cm dia)	10
Detritus	5
Periphyton	0 (Lots of filamentous)
Blanketing Silt	0
Undercut Banks	0

Substrate Description

Cover	Value (%)
Bedrock	0
Boulder (>256 mm)	10
Cobble (64-256 mm)	20
Pebble (4-64 mm)	0
Gravel (2-4 mm)	5
Sand (0.05 -2 mm)	5
Silt/Clay (<0.05 mm)	60

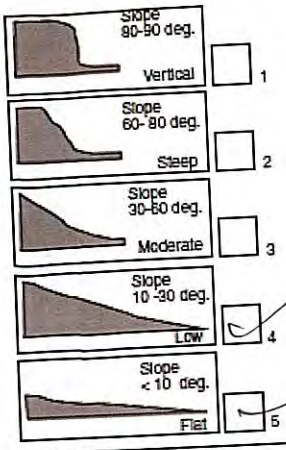
Macrophytes and Algae

Primary Production	In
Macrophyte % [20]	Edge % [100]
	Run % [ ]
	Riffle % [ ]
	Pool (rocky) % [ ]
Algae % [30]	Edge % [90]
	Run % [ ]
	Riffle % [ ]
	Pool (rocky) % [10]

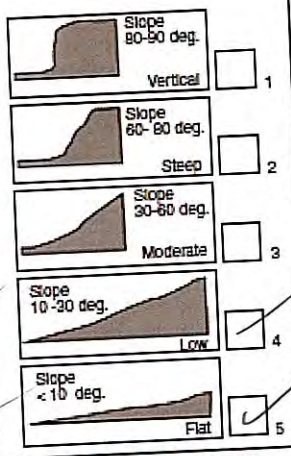
Macrophyte Botanical Name	Value (%)
1. Myriophyllum	25
2. Bacopa (check photo)	25
3. Ludwigia	25
4. Typha	25
5	
6	
7	
8.	

REACH OBSERVATIONS (of 100 m stream length)

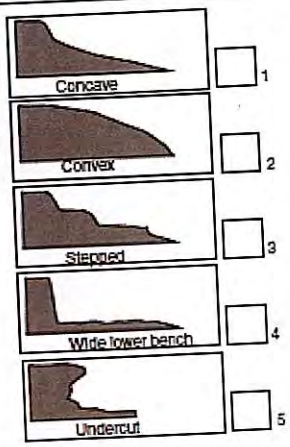
3 LEFT BANK Slope (RANK types)



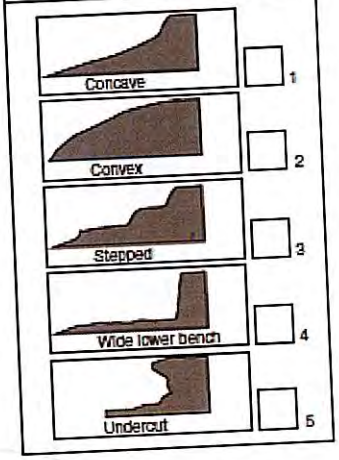
8 RIGHT BANK Slope (RANK types)



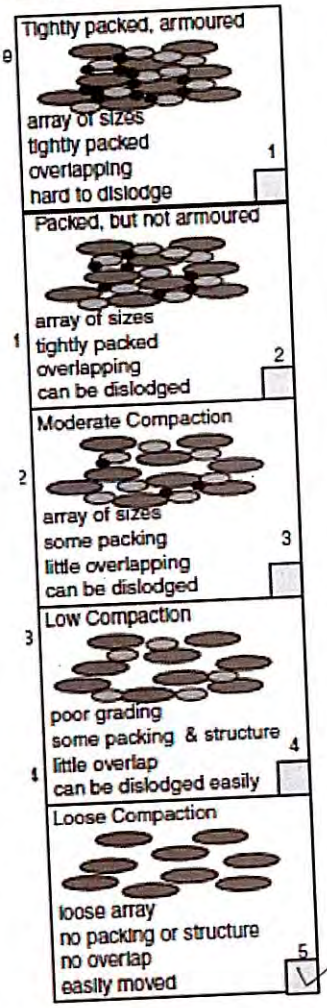
4 LEFT BANK Shape (RANK types)



9 RIGHT BANK Shape (RANK types)



5 Bed Compaction



Riparian Zone Structure

Left Bank	
Width (m)	5
Bare (%)	10
Grasses (%)	50
Shrubs (%)	10
Trees <10 m high (%)	0
Trees >10 m high (%)	0
Exotics (%)	30

Right Bank	
Width (m)	5
Bare (%)	10
Grasses (%)	50
Shrubs (%)	10
Trees <10 m high (%)	0
Trees >10 m high (%)	0
Exotics (%)	30

Longitudinal Extent of Riparian Vegetation

Category	Description	Category	Description
None	No trees or shrubs, only exotic grasses or pasture	Occasional clumps	Clumps of tree among exotic grasses and pastures
Isolated/scattered	Isolated trees or shrubs among exotic grasses or pasture	Semi-contiguous	Cleared patches of trees
Regularly space	Evenly spaced trees among exotic grasses and pastures	Contiguous	Intact tree line

Comments

cleared, v. little habitat, Boulders, sticks & filamentous algae providing some habitat. Algal scum on shore → elevated nutrients?

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Site Details

Site Number	AB3
Watercourse	
Date (DD/MM/YYYY)	30/1/23
Time (24 hrs)	12:30

Site Name	
Collector (initials)	
Project Code	

Edge/Backwater: Yes ☐ No ☐ QA/QC Residue Yes ☐ No ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1	1	JH	JH	AB3 – Edge	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.2	**Substrate Description (% cover)**			
Mean Wetted Width (m)	>100m	Bedrock	—	Gravel (2-4 mm)	10
Method: Sweep		Boulder (>256 mm)	—	Sand (0.05- 2 mm)	—
Canopy cover (%)	0	Cobble (64-256 mm)	—	Silt/Clay (<0.05 mm)	90
Shading (%)	0	Pebble (4 – 64 mm)	—		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	10	Periphyton	5	Bank overhang veg	0
Sticks (<2 cm diam)	10	Moss	—	Trailing bank veg	0
Branches (<15 cm diam)	0	Filamentous algae	40	Blanketing Silt	0
Logs (>15 cm diam)	0	Macrophytes	40	Substrate anoxia	0

Comments

Very exposed lake edge w/ little habitat apart from dense algae / myriophyllum.

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Bed: Yes ☐ No ☐ Collected by: [|] Picked by: [|] No. vials/reps: [ ] QA/QC Residue Yes ☐ No ☐

Type: Riffle ☐ Run ☐ Pool (rocky/gravel) ☐ Pool (sandy/silt) ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1		JH	JH	ABS-Bed	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.5	**Substrate Description (% cover)**			
Mean Wetted Width (m)	>100m	Bedrock	—	Gravel (2-4 mm)	10
Method: Sweep		Boulder (>256 mm)	—	Sand (0.05- 2 mm)	—
Canopy cover (%)	0	Cobble (64-256 mm)	—	Silt/Clay (<0.005 mm)	90
Shading (%)	—	Pebble (4 – 64 mm)	—		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	5	Periphyton	0	Bank overhang veg	0
Sticks (<2 cm diam)	5	Moss	0	Trailing bank veg	0
Branches (<15 cm diam)	0	Filamentous algae	10	Blanketing Silt	0
Logs (>15 cm diam)	0	Macrophytes	5	Substrate anoxia	0

Comments

Turbid, little habitat.

Hydrobiology

REACH OBSERVATIONS (of 100 m stream length)

Site Details

Site Number	AB
Watercourse	
Date (DD/MM/YYYY)	3/
Time (24 hrs)	10:00

Site Name	
Collector (initials):	Project Code:
Drone footage time:	length:

Observations

Left Bank land use: cleared	Algae on substrate % cover: 30
Left Bank erosion (%): —	Algae in water column % cover: 20
Right Bank land use: cleared	Flow level: ☐ None ☐ Low ☐ Moderate ☐ High ☐ Flood
Right Bank erosion %: —	Local catchment erosion %: —
Point Source Discharges ☐ yes ☑ no	Sediment Odour ☐ yes ☑ no, Specify .....
Sediment Deposits ☐ None ☐ Sand ☐ Silt	Water Odour ☐ yes ☐ no, Specify .....
Bars (bed surface protruding from normal water level) %: —	

Macrohabitat

Cover	Value (%)
Riffle (%)	
Run (%)	
Pool (rocky) (%)	
Pool (sandy/silt) (%)	
Dry (%)	

Microhabitat

Cover	Value (%)
LWD (>15 cm dia)	5
SWD (<15 cm dia)	10
Detritus	10
Periphyton	—
Blanketing Silt	—
Undercut Banks	—

Substrate Description

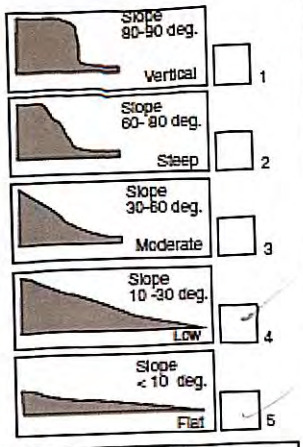
Cover	Value (%)
Bedrock	—
Boulder (>256 mm)	5
Cobble (64-256 mm)	10
Pebble (4-64 mm)	—
Gravel (2-4 mm)	—
Sand (0.05 -2 mm)	—
Silt/Clay (<0.05 mm)	90

Macrophytes and Algae

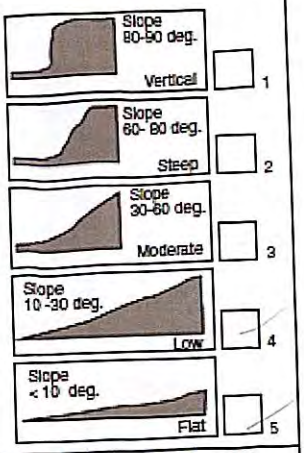
Primary Production	In	
Macrophyte % [35]	Edge % [100]	
	Run % [ ]	
	Riffle % [ ]	
	Pool (rocky) % [ ]	
Algae % [50]	Edge % [90]	
	Run % [ ]	
	Riffle % [ ]	
	Pool (rocky) % [10]	

Macrophyte Botanical Name	Value (%)
1. Myriophyllum	70
2. Ludwigia	10
3. Persicaria	10
4. Cyperus	10
5	
6	
7	
8.	

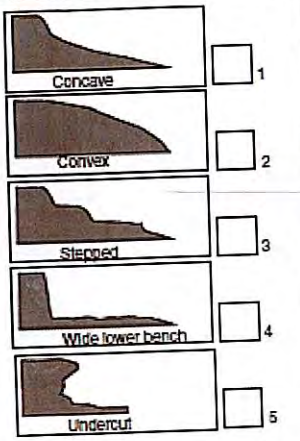
3 LEFT BANK Slope (RANK types)



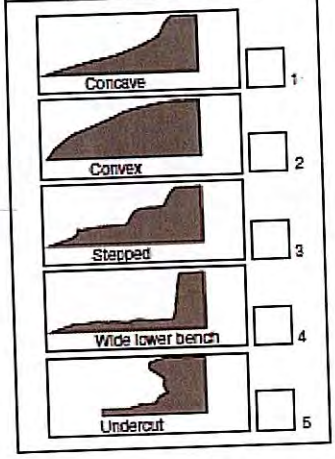
8 RIGHT BANK Slope (RANK types)



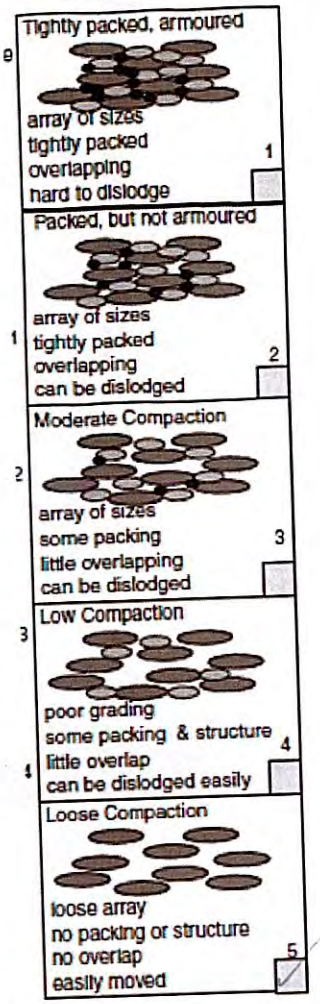
4 LEFT BANK Shape (RANK types)



9 RIGHT BANK Shape (RANK types)



5 Bed Compaction



Riparian Zone Structure

Left Bank	
Width (m)	5
Bare (%)	10
Grasses (%)	50
Shrubs (%)	10
Trees <10 m high (%)	0
Trees >10 m high (%)	0
Exotics (%)	30

Right Bank	
Width (m)	5
Bare (%)	10
Grasses (%)	50
Shrubs (%)	10
Trees <10 m high (%)	NC
Trees >10 m high (%)	0
Exotics (%)	30

Longitudinal Extent of Riparian Vegetation

Category	Description	Category	Description
None	No trees or shrubs, only exotic grasses or pasture	Occasional clumps	Clumps of tree among exotic grasses and pastures
Isolated/scattered	Isolated trees or shrubs among exotic grasses or pasture	Semi-contiguous	Cleared patches of trees
Regularly space	Evenly spaced trees among exotic grasses and pastures	Contiguous	Intact tree line

Comments

Same as previous side. Lots of decaying algae from water level drop. Dense macrophytes + filamentous algae along edge. Create other habitat diversity. Some dead trees (LWD).

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Site Details

Site Number	AB2
Watercourse	
Date (DD/MM/YYYY)	31/1/23
Time (24 hrs)	10:30

Site Name	
Collector (initials)	
Project Code	

Edge/Backwater: Yes ☑ No ☐ QA/QC Residue Yes ☐ No ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1	1	JH	JL	AB2-Edge	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.5	**Substrate Description (% cover)**			
Mean Wetted Width (m)	>100	Bedrock	0	Gravel (2-4 mm)	0
Method: Sweep		Boulder (>256 mm)	0	Sand (0.05- 2 mm)	5
Canopy cover (%)	0	Cobble (64-256 mm)	5	Silt/Clay (<0.05 mm)	95
Shading (%)	5	Pebble (4 – 64 mm)	0		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	10	Periphyton	5	Bank overhang veg	0
Sticks (<2 cm diam)	5	Moss	0	Trailing bank veg	0
Branches (<15 cm diam)	5	Filamentous algae	50	Blanketing Silt	5
Logs (>15 cm diam)	0	Macrophytes	30	Substrate anoxia	0

Comments

Myriophyllum + algae

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Bed: Yes ☑ No ☐ Collected by: [|] Picked by: [|] No. vials/reps: [ ] QA/QC Residue Yes ☐ No ☐

Type: Riffle ☐ Run ☐ Pool (rocky/gravel) ☐ Pool (sandy/silt) ☑

Rep	No Vials	Collected by	Picked by	Label	Comment
1	1	JH	JH	AB2 - Bed	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.75	**Substrate Description (% cover)**			
Mean Wetted Width (m)	>100	Bedrock	—	Gravel (2-4 mm)	—
Method: Sweep		Boulder (>256 mm)	—	Sand (0.05- 2 mm)	—
Canopy cover (%)	0	Cobble (64-256 mm)	—	Silt/Clay (<0.005 mm)	100
Shading (%)	0	Pebble (4 – 64 mm)	—		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	5	Periphyton	—	Bank overhang veg	—
Sticks (<2 cm diam)	5	Moss	—	Trailing bank veg	—
Branches (<15 cm diam)	—	Filamentous algae	10	Blanketing Silt	—
Logs (>15 cm diam)	—	Macrophytes	—	Substrate anoxia	

Comments

Hydrobiology

REACH OBSERVATIONS (of 100 m stream length)

Site Details

Site Number	AB8
Watercourse	
Date (DD/MM/YYYY)	31/1/23
Time (24 hrs)	15:15

Site Name	
Collector (initials):	Project Code:
Drone footage time:	length:

Observations

Left Bank land use: Native / cleared	Algae on substrate % cover: 20
Left Bank erosion (%): 0	Algae in water column % cover: 10
Right Bank land use: Native / cleared	Flow level: ☑ None ☑ Low ☐ Moderate ☐ High ☐ Flood
Right Bank erosion %: 5	Local catchment erosion %: —
Point Source Discharges ☐ yes ☑ no	Sediment Odour ☐ yes ☑ no, Specify .....
Sediment Deposits ☑ None ☐ Sand ☐ Silt	Water Odour ☐ yes ☐ no, Specify .....
Bars (bed surface protruding from normal water level) %: —	

Macrohabitat

Cover	Value (%)
Riffle (%)	0
Run (%)	0
Pool (rocky) (%)	100
Pool (sandy/silt) (%)	0
Dry (%)	0

Microhabitat

Cover	Value (%)
LWD (>15 cm dia)	5
SWD (<15 cm dia)	5
Detritus	10
Periphyton	0
Blanketing Silt	0
Undercut Banks	15

Substrate Description

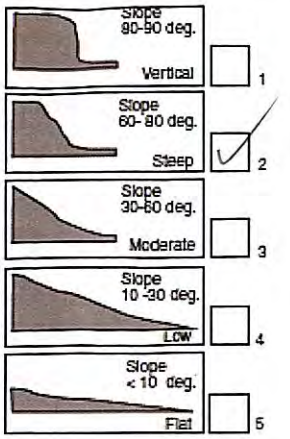
Cover	Value (%)
Bedrock	0
Boulder (>256 mm)	0
Cobble (64-256 mm)	20
Pebble (4-64 mm)	60
Gravel (2-4 mm)	10
Sand (0.05 -2 mm)	0
Silt/Clay (<0.05 mm)	10

Macrophytes and Algae

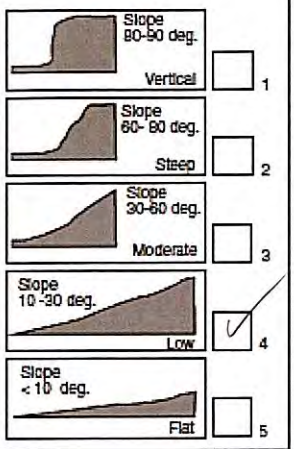
Primary Production	In	
Macrophyte % [80]	Edge % [50]	
	Run % [ ]	
	Riffle % [ ]	
	Pool (rocky) % [50]	
Algae % [80]	Edge % [50]	
	Run % [ ]	
	Riffle % [ ]	
	Pool (rocky) % [50]	

Macrophyte Botanical Name	Value (%)
1. Ceratophyllum	50
2. Hydrilla	10
3. Ludwigia	10
4. Lemna	10
5 Cyperus	10
6 Myriophyllum	10
7	
8.	

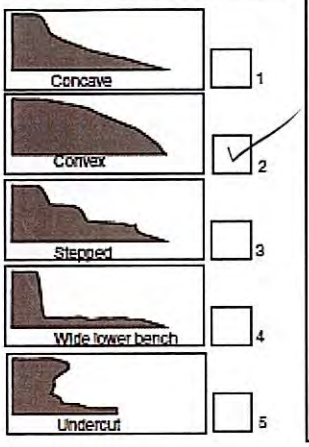
7 LEFT BANK Slope (RANK types)



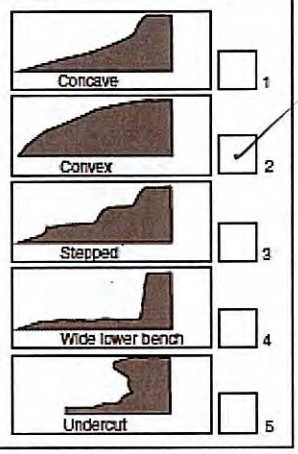
8 RIGHT BANK Slope (RANK types)



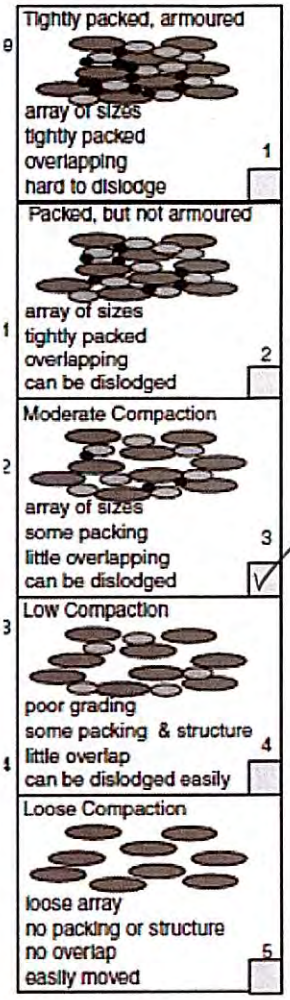
4 LEFT BANK Shape (RANK types)



9 RIGHT BANK Shape (RANK types)



5 Bed Compaction



Riparian Zone Structure

Left Bank	
Width (m)	10
Bare (%)	5
Grasses (%)	5
Shrubs (%)	10
Trees <10 m high (%)	10
Trees >10 m high (%)	60
Exotics (%)	10
Right Bank	
Width (m)	10
Bare (%)	5
Grasses (%)	40
Shrubs (%)	5
Trees <10 m high (%)	20
Trees >10 m high (%)	10
Exotics (%)	20

Longitudinal Extent of Riparian Vegetation

Category	Description	Category	Description
None	No trees or shrubs, only exotic grasses or pasture	Occasional clumps	Clumps of tree among exotic grasses and pastures
Isolated/scattered	Isolated trees or shrubs among exotic grasses or pasture	Semi-contiguous	Cleared patches of trees
Regularly space	Evenly spaced trees among exotic grasses and pastures	Contiguous	Intact tree line

Comments

Site just D/S from weir. V. dense + diverse macrophytes with filamentous algae covering most of water. Left bank riparian relatively intact w/ gums, Casuarina + callistemon. Right bank semi-cleared for access. Moderate habitat diversity → Undercut banks and some LWD. Fish observed gathering at weir wall.

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Site Details

Site Number	AB8
Watercourse	
Date (DD/MM/YYYY)	31/1/23
Time (24 hrs)	19:00

Site Name	
Collector (initials)	
Project Code	

Edge/Backwater: Yes ☑ No ☐ QA/QC Residue Yes ☐ No ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1		JH	JH	AB8 - Edge	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.5	**Substrate Description (% cover)**			
Mean Wetted Width (m)	30m	Bedrock	—	Gravel (2-4 mm)	—
Method: Sweep		Boulder (>256 mm)	—	Sand (0.05- 2 mm)	—
Canopy cover (%)	0	Cobble (64-256 mm)	—	Silt/Clay (<0.05 mm)	100
Shading (%)	0	Pebble (4 – 64 mm)	—		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	10	Periphyton	0	Bank overhang veg	—
Sticks (<2 cm diam)	10	Moss	0	Trailing bank veg	20
Branches (<15 cm diam)	5	Filamentous algae	50	Blanketing Silt	—
Logs (>15 cm diam)	0	Macrophytes	40	Substrate anoxia	—

Comments

Dense macrophytes + algae

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Bed: Yes ☑ No ☐ Collected by: [|] Picked by: [|] No. vials/reps: [ ] QA/QC Residue Yes ☐ No ☐

Type: Riffle ☐ Run ☐ Pool (rocky/gravel) ☐ Pool (sandy/silt) ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1		JH	JH	ABS-Bed	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.7	**Substrate Description (% cover)**			
Mean Wetted Width (m)	30	Bedrock	0	Gravel (2-4 mm)	5
Method: Sweep		Boulder (>256 mm)	0	Sand (0.05- 2 mm)	0
Canopy cover (%)	0	Cobble (64-256 mm)	40	Silt/Clay (<0.005 mm)	5
Shading (%)	0	Pebble (4 – 64 mm)	50		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	10	Periphyton	0	Bank overhang veg	0
Sticks (<2 cm diam)	0	Moss	0	Trailing bank veg	0
Branches (<15 cm diam)	0	Filamentous algae	20	Blanketing Silt	0
Logs (>15 cm diam)	0	Macrophytes	20	Substrate anoxia	0

Comments

Rocky substrate, habitat largely algae + macrophytes

Hydrobiology

REACH OBSERVATIONS (of 100 m stream length)

Site Details

Site Number	ABS
Watercourse	
Date (DD/MM/YYYY)	1/2/23
Time (24 hrs)	11:30

Site Name	
Collector (initials):	Project Code:
Drone footage time:	length:

Observations

Left Bank land use: Dam	Algae on substrate % cover: 10
Left Bank erosion (%): —	Algae in water column % cover: 10
Right Bank land use: Dam	Flow level: ☑ None ☑ Low ☐ Moderate ☐ High ☐ Flood
Right Bank erosion %: —	Local catchment erosion %: —
Point Source Discharges ☐ yes ☑ no	Sediment Odour ☑ yes ☐ no, Specify Organic
Sediment Deposits ☑ None ☐ Sand ☐ Silt	Water Odour ☐ yes ☑ no, Specify
Bars (bed surface protruding from normal water level) %: —	

Macrohabitat

Cover	Value (%)
Riffle (%)	
Run (%)	
Pool (rocky) (%)	
Pool (sandy/silt) (%)	100
Dry (%)	

Microhabitat

Cover	Value (%)
LWD (>15 cm dia)	1
SWD (<15 cm dia)	10
Detritus	5
Periphyton	15
Blanketing Silt	0
Undercut Banks	0

Substrate Description

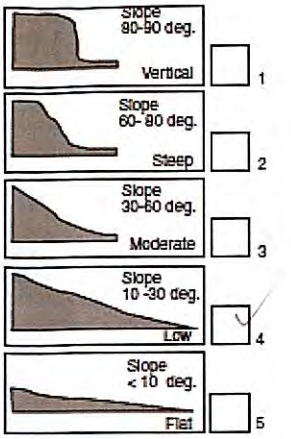
Cover	Value (%)
Bedrock	—
Boulder (>256 mm)	20
Cobble (64-256 mm)	20
Pebble (4-64 mm)	—
Gravel (2-4 mm)	—
Sand (0.05 -2 mm)	
Silt/Clay (<0.05 mm)	60

Macrophytes and Algae

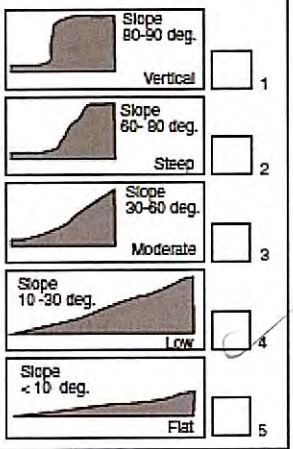
Primary Production	In
Macrophyte % [60]	Edge % [100]
	Run % [ ]
	Riffle % [ ]
	Pool (rocky) % [ ]
Algae % [15]	Edge % [100]
	Run % [ ]
	Riffle % [ ]
	Pool (rocky) % [ ]

Macrophyte Botanical Name	Value (%)
1. Persicaria	80
2. Cyperus	10
3. Ludwigia	10
4.	
5	
6	
7	
8.	

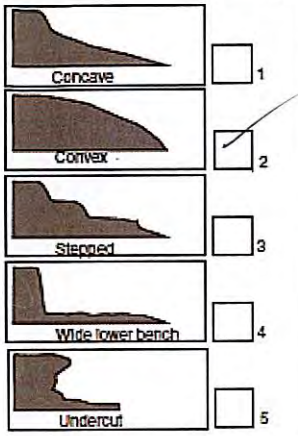
3 LEFT BANK Slope (RANK types)



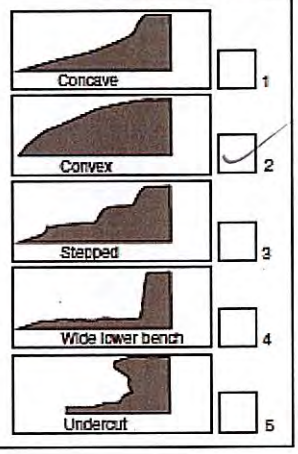
8 RIGHT BANK Slope (RANK types)



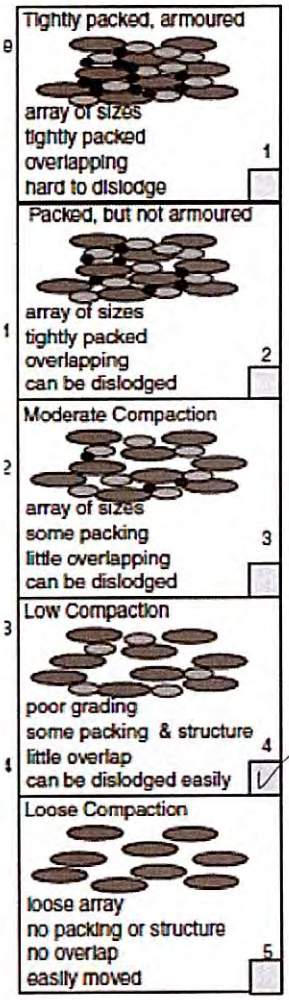
4 LEFT BANK Shape (RANK types)



9 RIGHT BANK Shape (RANK types)



5 Bed Compaction

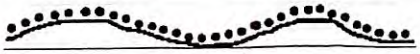


Riparian Zone Structure

Left Bank	
Width (m)	5
Bare (%)	1
Grasses (%)	30
Shrubs (%)	30
Trees <10 m high (%)	1
Trees >10 m high (%)	—
Exotics (%)	40

Right Bank	
Width (m)	5
Bare (%)	1
Grasses (%)	30
Shrubs (%)	30
Trees <10 m high (%)	—
Trees >10 m high (%)	—
Exotics (%)	40

Longitudinal Extent of Riparian Vegetation

Category	Description	Category	Description
None	 No trees or shrubs, only exotic grasses or pasture	Occasional clumps	 Clumps of tree among exotic grasses and pastures
Isolated/scattered No trees	 Isolated trees or shrubs among exotic grasses or pasture	Semi-contiguous	 Cleared patches of trees
Regularly space	 Evenly spaced trees among exotic grasses and pastures	Contiguous	 Intact tree line

Comments

Impoundment (at 1% capacity). Turtle haven. Habitat provided by boulders/cobbles at edges. Boggy in deeper areas. Lots of Persicaria but is setting above water level.

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Site Details

Site Number	ABS
Watercourse	
Date (DD/MM/YYYY)	
Time (24 hrs)	11:50

Site Name	
Collector (initials)	
Project Code	

Edge/Backwater: Yes ☐ No ☐ QA/QC Residue Yes ☐ No ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1	1	JFI	JH	ABS-Edge	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.75	**Substrate Description (% cover)**			
Mean Wetted Width (m)	2100	Bedrock		Gravel (2-4 mm)	
Method:		Boulder (>256 mm)	10	Sand (0.05- 2 mm)	
Canopy cover (%)	0	Cobble (64-256 mm)	20	Silt/Clay (<0.05 mm)	70
Shading (%)	0	Pebble (4 – 64 mm)			
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	15	Periphyton	10	Bank overhang veg	0
Sticks (<2 cm diam)	10	Moss	0	Trailing bank veg	0
Branches (<15 cm diam)	5	Filamentous algae	0	Blanketing Silt	0
Logs (>15 cm diam)	—	Macrophytes	0	Substrate anoxia	—

Comments

Dislodged cobbles for macros. Habitat limited but

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Bed: Yes ☑ No ☐ Collected by: [|] Picked by: [|] No. vials/reps: [ ] QA/QC Residue Yes ☐ No ☐

Type: Riffle ☐ Run ☐ Pool (rocky/gravel) ☑ Pool (sandy/silt) ☑

Rep	No Vials	Collected by	Picked by	Label	Comment
1					
2					
3					
4					
5					

Variables

Mean Sample Depth (m)		**Substrate Description (% cover)**			
Mean Wetted Width (m)		Bedrock		Gravel (2-4 mm)	
Method:		Boulder (>256 mm)		Sand (0.05- 2 mm)	
Canopy cover (%)		Cobble (64-256 mm)		Silt/Clay (<0.005 mm)	
Shading (%)		Pebble (4 – 64 mm)			
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)		Periphyton		Bank overhang veg	
Sticks (<2 cm diam)		Moss		Trailing bank veg	
Branches (<15 cm diam)		Filamentous algae		Blanketing Silt	
Logs (>15 cm diam)		Macrophytes		Substrate anoxia	

Comments

Hydrobiology

REACH OBSERVATIONS (of 100 m stream length)

Site Details

Site Number	ABL4
Watercourse	
Date (DD/MM/YYYY)	2/2/23
Time (24 hrs)	9:30

Site Name	
Collector (initials):	Project Code:
Drone footage time:	length:

Observations

Left Bank land use: Native/cleared	Algae on substrate % cover: 5
Left Bank erosion (%): —	Algae in water column % cover: 0
Right Bank land use: Native/cleared	Flow level: ☑ None ☐ Low ☐ Moderate ☐ High ☐ Flood
Right Bank erosion %: —	Local catchment erosion %: —
Point Source Discharges ☐ yes ☑ no	Sediment Odour ☑ yes ☐ no, Specify sulphur/rotten
Sediment Deposits ☑ None ☐ Sand ☐ Silt	Water Odour ☑ yes ☐ no, Specify sulphur/rotten
Bars (bed surface protruding from normal water level) %:	

Macrohabitat

Cover	Value (%)
Riffle (%)	—
Run (%)	—
Pool (rocky) (%)	—
Pool (sandy/silt) (%)	100
Dry (%)	—

Microhabitat

Cover	Value (%)
LWD (>15 cm dia)	5
SWD (<15 cm dia)	10
Detritus	10
Periphyton	5
Blanketing Silt	yes
Undercut Banks	—

Substrate Description

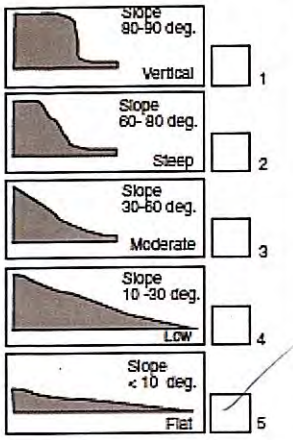
Cover	Value (%)
Bedrock	—
Boulder (>256 mm)	5
Cobble (64-256 mm)	20
Pebble (4-64 mm)	10
Gravel (2-4 mm)	0
Sand (0.05 -2 mm)	0
Silt/Clay (<0.05 mm)	65

Macrophytes and Algae

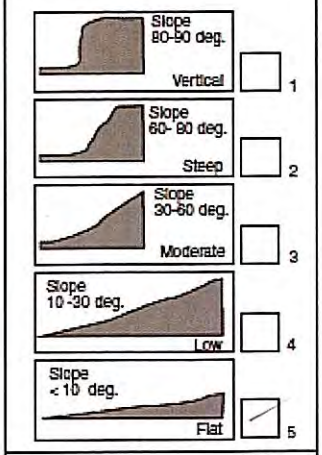
Primary Production	In
Macrophyte % [90]	Edge % [50]
	Run % [—]
	Riffle % [—]
	Pool (rocky) % [50]
Algae % [90]	Edge % [50]
	Run % [ ]
	Riffle % [ ]
	Pool (rocky) % [50]

Macrophyte Botanical Name	Value (%)
1. Phragmites	40
2. Ceratophyllum	40
3. Lemna	5
4. Nymphoides	5
5 Azolla	5
6 Myriophyllum	5
7	
8.	

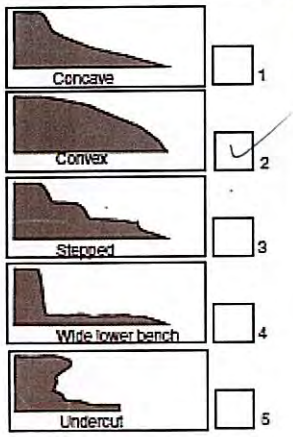
3 LEFT BANK Slope (RANK types)



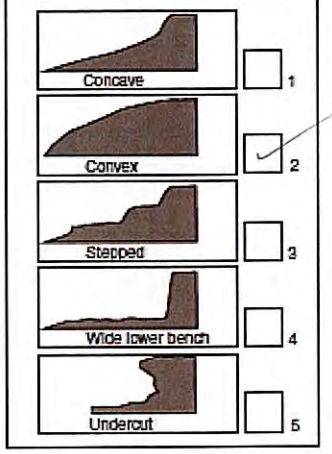
8 RIGHT BANK Slope (RANK types)



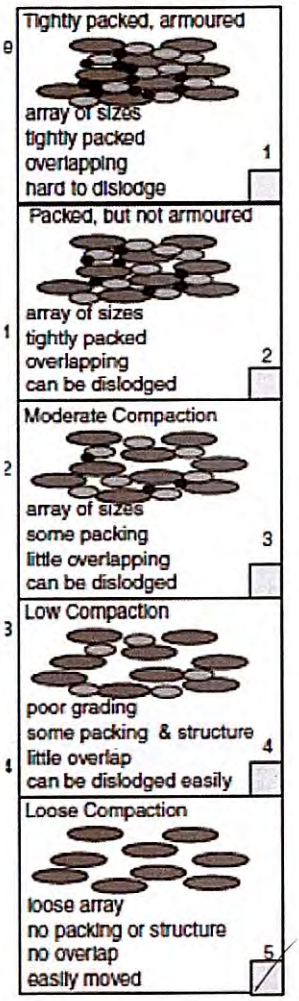
4 LEFT BANK Shape (RANK types)



9 RIGHT BANK Shape (RANK types)



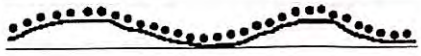
5 Bed Compaction



Riparian Zone Structure

Left Bank	
Width (m)	
Bare (%)	
Grasses (%)	10
Shrubs (%)	90
Trees <10 m high (%)	
Trees >10 m high (%)	
Exotics (%)	
Right Bank	
Width (m)	
Bare (%)	
Grasses (%)	10
Shrubs (%)	90
Trees <10 m high (%)	
Trees >10 m high (%)	
Exotics (%)	

Longitudinal Extent of Riparian Vegetation

Category	Description	Category	Description
None	 No trees or shrubs, only exotic grasses or pasture	Occasional clumps	 Clumps of tree among exotic grasses and pastures
Isolated/scattered	 Isolated trees or shrubs among exotic grasses or pasture	Semi-contiguous	 Cleared patches of trees
Regularly space	 Evenly spaced trees among exotic grasses and pastures	Contiguous	 Intact tree line

Comments

Essentially a wetland dominated by typha on edge + ceratophyllum / submerged. Water + sediment with anoxic sulphuric smell, substrate rocky with thick layer of organic matter and blanketed with dark silt. Electrofishing not so effective despite 5 Amps → vegetation may be absorbing.

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Site Details

Site Number	AB4
Watercourse	
Date (DD/MM/YYYY)	2/2/23
Time (24 hrs)	9:00

Site Name	
Collector (initials)	
Project Code	

Edge/Backwater: Yes ☑ No ☐ QA/QC Residue Yes ☐ No ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1	1	JH	JH	AB-4 Edge	
2	1	JH	JH	AB-4 Bed	
3					
4					
5					

Variables

Mean Sample Depth (m)	0,7	**Substrate Description (% cover)**			
Mean Wetted Width (m)	10	Bedrock	—	Gravel (2-4 mm)	—
Method: sweep		Boulder (>256 mm)	—	Sand (0.05- 2 mm)	—
Canopy cover (%) 0		Cobble (64-256 mm)	—	Silt/Clay (<0.05 mm)	100
Shading (%) 0		Pebble (4 – 64 mm)	—		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	20	Periphyton	5	Bank overhang veg	0
Sticks (<2 cm diam)	0	Moss	0	Trailing bank veg	0
Branches (<15 cm diam)	0	Filamentous algae	30	Blanketing Silt	10
Logs (>15 cm diam)	0	Macrophytes	30	Substrate anoxia	Yes

Comments

Edge not well defined as Phragmites common across bank. Habitat heavily poor → dominated by Phragmites + rotting vegetation. Anoxic smell + blanketing silt → clogged up macro net

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Bed: Yes ☐ No ☐ Collected by: [|] Picked by: [|] No. vials/reps: [ ] QA/QC Residue Yes ☐ No ☐

Type: Riffle ☐ Run ☐ Pool (rocky/gravel) ☐ Pool (sandy/silt) ☑

Rep	No Vials	Collected by	Picked by	Label	Comment
1	1	TH	TH	APL-Pd	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.7	**Substrate Description (% cover)**			
Mean Wetted Width (m)	10	Bedrock		Gravel (2-4 mm)	
Method:		Boulder (>256 mm)	30	Sand (0.05- 2 mm)	
Canopy cover (%)	0	Cobble (64-256 mm)	30	Silt/Clay (<0.005 mm)	40
Shading (%)	0	Pebble (4 – 64 mm)			
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	5	Periphyton		Bank overhang veg	
Sticks (<2 cm diam)	0	Moss	0	Trailing bank veg	0
Branches (<15 cm diam)	0	Filamentous algae	10	Blanketing Silt	Y/N
Logs (>15 cm diam)	0	Macrophytes	10	Substrate anoxia	Y/N

Comments

Sample digested - v silted → not clogged with fine silt. Anoxic smell.

Hydrobiology

REACH OBSERVATIONS (of 100 m stream length)

Site Details

Site Number	ABS
Watercourse	
Date (DD/MM/YYYY)	2/2/23
Time (24 hrs)	13:30

Site Name	
Collector (initials):	Project Code:
Drone footage time:	length:

Observations

Left Bank land use: Native	Algae on substrate % cover: 10
Left Bank erosion (%): —	Algae in water column % cover: —
Right Bank land use: Native	Flow level: ☐ None ☐ Low ☐ Moderate ☐ High ☐ Flood
Right Bank erosion %: —	Local catchment erosion %: —
Point Source Discharges ☐ yes ☑ no	Sediment Odour ☑ yes ☐ no, Specify ...Anoxic...
Sediment Deposits ☐ None ☐ Sand ☑ Silt	Water Odour ☑ yes ☐ no, Specify ...Anoxic...
Bars (bed surface protruding from normal water level) %: —	

Macrohabitat

Cover	Value (%)
Riffle (%)	—
Run (%)	—
Pool (rocky) (%)	—
Pool (sandy/silt) (%)	100
Dry (%)	—

Microhabitat

Cover	Value (%)
LWD (>15 cm dia)	5
SWD (<15 cm dia)	25
Detritus	30
Periphyton	5
Blanketing Silt	Yes
Undercut Banks	0

Substrate Description

Cover	Value (%)
Bedrock	0
Boulder (>256 mm)	0
Cobble (64-256 mm)	40
Pebble (4-64 mm)	0
Gravel (2-4 mm)	0
Sand (0.05 -2 mm)	0
Silt/Clay (<0.05 mm)	60

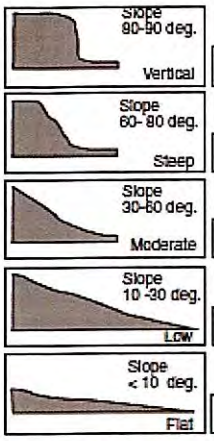
Macrophytes and Algae

Primary Production	In	
Macrophyte % [90]	Edge % [50]	
	Run % [ ]	
	Riffle % [ ]	
	Pool (rocky) % [50]	
Algae % [90]	Edge % [50]	
	Run % [ ]	
	Riffle % [ ]	
	Pool (rocky) % [50]	

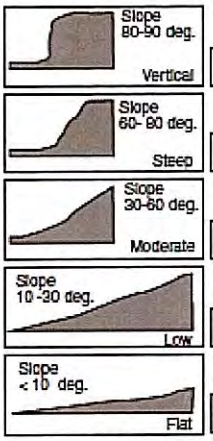
Macrophyte Botanical Name	Value (%)
1. Persicaria	30
2. Nymphoides indica	10
3. Ceratophyllum	40
4. Ludwigia	5
5 Lemna	5
6 Azolla	10
7	
8.	

Hydrobiology

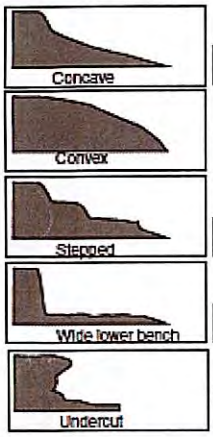
3 LEFT BANK Slope (RANK types)



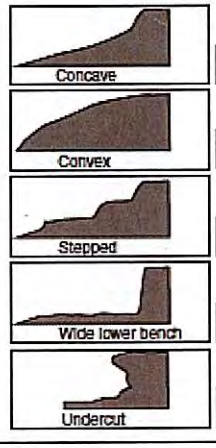
8 RIGHT BANK Slope (RANK types)



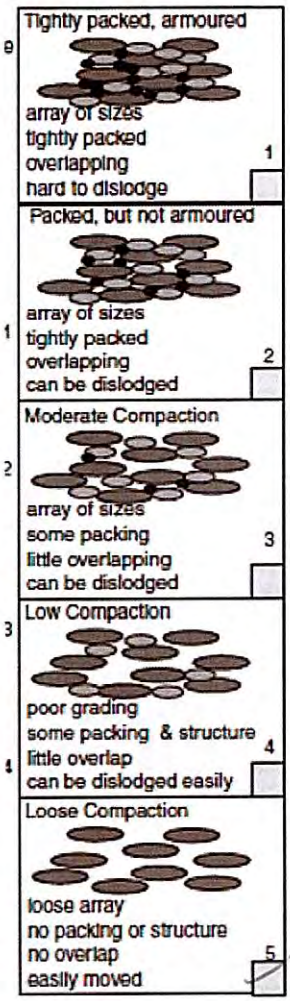
4 LEFT BANK Shape (RANK types)



9 RIGHT BANK Shape (RANK types)



5 Bed Compaction



Riparian Zone Structure

Left Bank	
Width (m)	10
Bare (%)	
Grasses (%)	30
Shrubs (%)	40
Trees <10 m high (%)	
Trees >10 m high (%)	20
Exotics (%)	10

Right Bank	
Width (m)	10
Bare (%)	
Grasses (%)	30
Shrubs (%)	40
Trees <10 m high (%)	
Trees >10 m high (%)	20
Exotics (%)	10

Longitudinal Extent of Riparian Vegetation

Category	Description	Category	Description
None	No trees or shrubs, only exotic grasses or pasture	Occasional clumps	Clumps of tree among exotic grasses and pastures
Isolated/scattered	Isolated trees or shrubs among exotic grasses or pasture	Semi-contiguous	Cleared patches of trees
Regularly space	Evenly spaced trees among exotic grasses and pastures	Contiguous	Intact tree line

Comments

Similar to previous. Dense macrophytes/algae + rotting organic material

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Site Details

Site Number	ABS
Watercourse	
Date (DD/MM/YYYY)	13:00
Time (24 hrs)	2/2/23

Site Name	
Collector (initials)	
Project Code	

Edge/Backwater: Yes ☐ No ☐ QA/QC Residue Yes ☐ No ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1	1	JH	JH	ABS - Edge	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.5	**Substrate Description (% cover)**			
Mean Wetted Width (m)	50	Bedrock		Gravel (2-4 mm)	
Method:		Boulder (>256 mm)		Sand (0.05- 2 mm)	
Canopy cover (%)	0	Cobble (64-256 mm)		Silt/Clay (<0.05 mm)	100
Shading (%)	0	Pebble (4 – 64 mm)			
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	10	Periphyton		Bank overhang veg	
Sticks (<2 cm diam)	20	Moss		Trailing bank veg	
Branches (<15 cm diam)	5	Filamentous algae	30	Blanketing Silt	
Logs (>15 cm diam)		Macrophytes	30	Substrate anoxia	

Comments

soft silty with organics – similar to previous site

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Bed: Yes ☑ No ☐ Collected by: [|] Picked by: [|] No. vials/reps: [ ] QA/QC Residue Yes ☐ No ☐

Type: Riffle ☐ Run ☐ Pool (rocky/gravel) ☐ Pool (sandy/silt) ☑

Rep	No Vials	Collected by	Picked by	Label	Comment
1		JH	JM	ABS-Bed	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.5	**Substrate Description (% cover)**			
Mean Wetted Width (m)	50	Bedrock		Gravel (2-4 mm)	
Method:		Boulder (>256 mm)		Sand (0.05- 2 mm)	
Canopy cover (%)	0	Cobble (64-256 mm)	10	Silt/Clay (<0.005 mm)	90
Shading (%)	0	Pebble (4 – 64 mm)			
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	20	Periphyton	~	Bank overhang veg	0
Sticks (<2 cm diam)	20	Moss	~	Trailing bank veg	0
Branches (<15 cm diam)	—	Filamentous algae	10	Blanketing Silt	0
Logs (>15 cm diam)	—	Macrophytes	10	Substrate anoxia	0

Comments

Similar to prev site

Hydrobiology

REACH OBSERVATIONS (of 100 m stream length)

Site Details

Site Number	AB7
Watercourse	
Date (DD/MM/YYYY)	3/2/22
Time (24 hrs)	9:45

Site Name	
Collector (initials):	Project Code:
Drone footage time:	length:

Observations

Left Bank land use: Native / cleared	Algae on substrate % cover: —
Left Bank erosion (%): —	Algae in water column % cover: —
Right Bank land use: Native / cleared	Flow level: ☑ None ☐ Low ☐ Moderate ☐ High ☐ Flood
Right Bank erosion %: —	Local catchment erosion %: —
Point Source Discharges ☐ yes ☑ no	Sediment Odour ☑ yes ☐ no, Specify Anoxic / organic
Sediment Deposits ☐ None ☐ Sand ☐ Silt —	Water Odour ☑ yes ☐ no, Specify Anoxic / organic
Bars (bed surface protruding from normal water level) %: —	

Macrohabitat

Cover	Value (%)
Riffle (%)	—
Run (%)	—
Pool (rocky) (%)	20
Pool (sandy/silt) (%)	80
Dry (%)	—

Microhabitat

Cover	Value (%)
LWD (>15 cm dia)	0
SWD (<15 cm dia)	5
Detritus	20
Periphyton	5
Blanketing Silt	Yes
Undercut Banks	—

Substrate Description

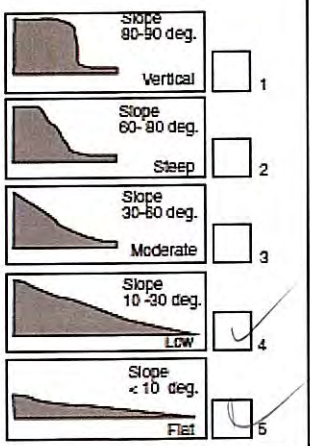
Cover	Value (%)
Bedrock	—
Boulder (>256 mm)	—
Cobble (64-256 mm)	—
Pebble (4-64 mm)	—
Gravel (2-4 mm)	20
Sand (0.05 -2 mm)	—
Silt/Clay (<0.05 mm)	80

Macrophytes and Algae

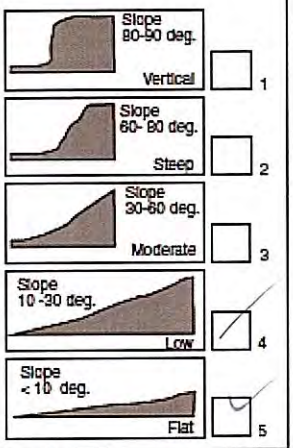
Primary Production	In	
Macrophyte % [10]	Edge % [90]	
	Run % [ ]	
	Riffle % [ ]	
	Pool (rocky) % [10]	
Algae % [10]	Edge % [100]	
	Run % [ ]	
	Riffle % [ ]	
	Pool (rocky) % [ ]	

Macrophyte Botanical Name	Value (%)
1. Typha	70
2. Persicaria	10
3. Acolla	10
4. Lemna	10
5	
6	
7	
8.	

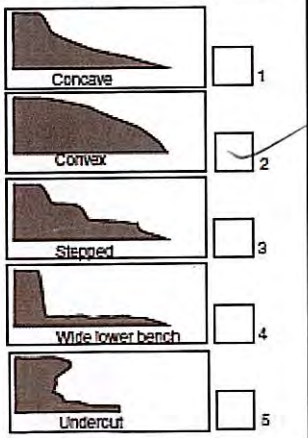
3 LEFT BANK Slope (RANK types)



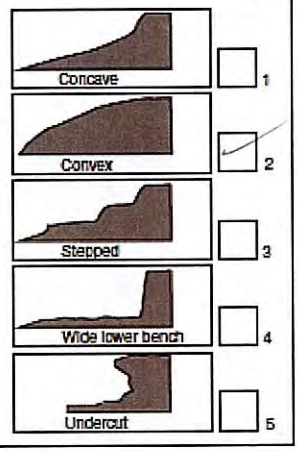
8 RIGHT BANK Slope (RANK types)



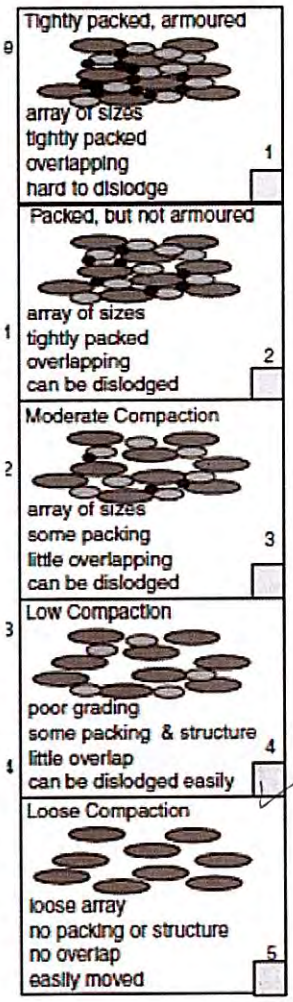
4 LEFT BANK Shape (RANK types)



9 RIGHT BANK Shape (RANK types)



5 Bed Compaction

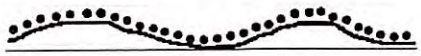


Riparian Zone Structure

Left Bank	
Width (m)	15
Bare (%)	10
Grasses (%)	10
Shrubs (%)	10
Trees <10 m high (%)	10
Trees >10 m high (%)	30
Exotics (%)	30

Right Bank	
Width (m)	15
Bare (%)	10
Grasses (%)	10
Shrubs (%)	10
Trees <10 m high (%)	10
Trees >10 m high (%)	30
Exotics (%)	30

Longitudinal Extent of Riparian Vegetation

Category	Description	Category	Description
None	 Nq trees or shrubs, only exotic grasses or pasture	Occasional clumps	 Clumps of tree among exotic grasses and pastures
Isolated/scattered	 Isolated trees or shrubs among exotic grasses or pasture	Semi-contiguous	 Cleared patches of trees
Regularly space	 Evenly spaced trees among exotic grasses and pastures	Contiguous	 Intact tree line

Comments

Riparian clearing associated with road crossing (D/S) + bridge crossing (D/S). Site highly overgrown with exotics choking most of channel (Paragrass + gamba (?) grass (see photo)). Water + sediment anoxic smell + lots of decaying veg. No access for boat + little for e-fishing / bykes. Habitat heavily low + lack of open water for large fish. Some macrophytes present (mostly Typha)

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Site Details

Site Number	AB7
Watercourse	
Date (DD/MM/YYYY)	3/2/23
Time (24 hrs)	10:00

Site Name	
Collector (initials)	
Project Code	

Edge/Backwater: Yes ☑ No ☐ QA/QC Residue Yes ☐ No ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1		JH	J+I	AB7 - Edg	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.4	**Substrate Description (% cover)**			
Mean Wetted Width (m)	20	Bedrock	—	Gravel (2-4 mm)	—
Method:		Boulder (>256 mm)	—	Sand (0.05- 2 mm)	—
Canopy cover (%)	0	Cobble (64-256 mm)	—	Silt/Clay (<0.05 mm)	100
Shading (%)	10	Pebble (4 – 64 mm)	—		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	30	Periphyton	5	Bank overhang veg	—
Sticks (<2 cm diam)	0	Moss	0	Trailing bank veg	—
Branches (<15 cm diam)	0	Filamentous algae	5	Blanketing Silt	Yes
Logs (>15 cm diam)	0	Macrophytes	65	Substrate anoxia	Yes

Comments

Edge undefined → Dense Typha. Habit largely living/dead Typha

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Bed: Yes ☑ No ☐ Collected by: [|] Picked by: [|] No. vials/reps: [ ] QA/QC Residue Yes ☐ No ☐

Type: Riffle ☐ Run ☐ Pool (rocky/gravel) ☐ Pool (sandy/silt) ☑

Rep	No Vials	Collected by	Picked by	Label	Comment
1		JH	JC	AB-7 Bed	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.7	**Substrate Description (% cover)**			
Mean Wetted Width (m)	30	Bedrock	—	Gravel (2-4 mm)	10
Method:		Boulder (>256 mm)	—	Sand (0.05- 2 mm)	—
Canopy cover (%)	0	Cobble (64-256 mm)	—	Silt/Clay (<0.005 mm)	90
Shading (%)	0	Pebble (4 – 64 mm)	—		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	40	Periphyton	—	Bank overhang veg	—
Sticks (<2 cm diam)	—	Moss	—	Trailing bank veg	—
Branches (<15 cm diam)	—	Filamentous algae	5	Blanketing Silt	—
Logs (>15 cm diam)	—	Macrophytes	10	Substrate anoxia	—

Comments

Boggy → substrate gravel + organic material
- Habitat diversity low

Hydrobiology

Site Details

Site Number	AB6
Watercourse	
Date (DD/MM/YYYY)	3/2/22
Time (24 hrs)	11:30

Site Name	
Collector (initials):	Project Code:
Drone footage time:	length:

Observations

Left Bank land use: Native/cleared	Algae on substrate % cover: —
Left Bank erosion (%): —	Algae in water column % cover: —
Right Bank land use: Native/cleared	Flow level: ☑ None ☑ Low ☐ Moderate ☐ High ☐ Flood
Right Bank erosion %: —	Local catchment erosion %: —
Point Source Discharges ☐ yes ☑ no	Sediment Odour ☑ yes ☐ no, Specify ...Anoxic...
Sediment Deposits ☑ None ☐ Sand ☐ Silt	Water Odour ☑ yes ☐ no, Specify ...Anoxic...
Bars (bed surface protruding from normal water level) %: —	

Macrohabitat

Cover	Value (%)
Riffle (%)	—
Run (%)	—
Pool (rocky) (%)	—
Pool (sandy/silt) (%)	100
Dry (%)	—

Microhabitat

Cover	Value (%)
LWD (>15 cm dia)	5
SWD (<15 cm dia)	5
Detritus	15
Periphyton	5
Blanketing Silt	—
Undercut Banks	10

Substrate Description

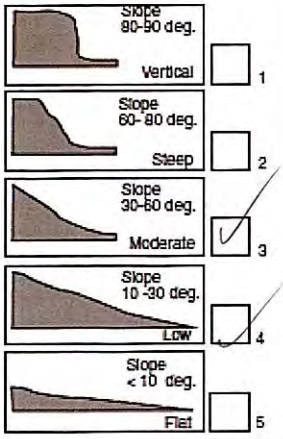
Cover	Value (%)
Bedrock	—
Boulder (>256 mm)	—
Cobble (64-256 mm)	—
Pebble (4-64 mm)	5
Gravel (2-4 mm)	10
Sand (0.05 -2 mm)	—
Silt/Clay (<0.05 mm)	85

Macrophytes and Algae

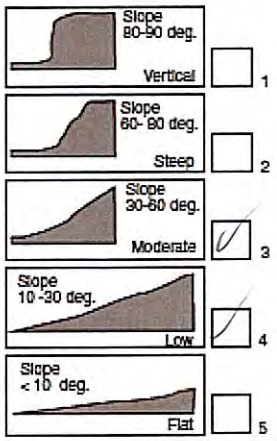
Primary Production	In	
Macrophyte % [75]	Edge % [30]	
	Run % [ ]	
	Riffle % [ ]	
	Pool (rocky) % [70]	
Algae % [20]	Edge % [ ]	
	Run % [ ]	
	Riffle % [ ]	
	Pool (rocky) % [100]	

Macrophyte Botanical Name	Value (%)
1. Ceratophyllum	60
2. Typha	10
3. Nitella	5
4. Lemna	5
5	
6	
7	
8.	

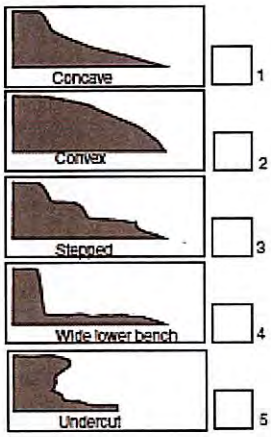
3 LEFT BANK Slope (RANK types)



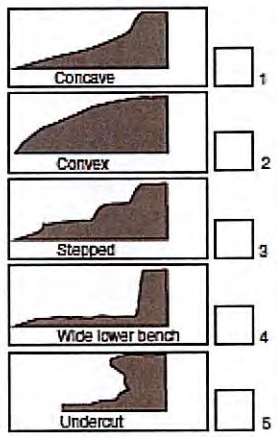
8 RIGHT BANK Slope (RANK types)



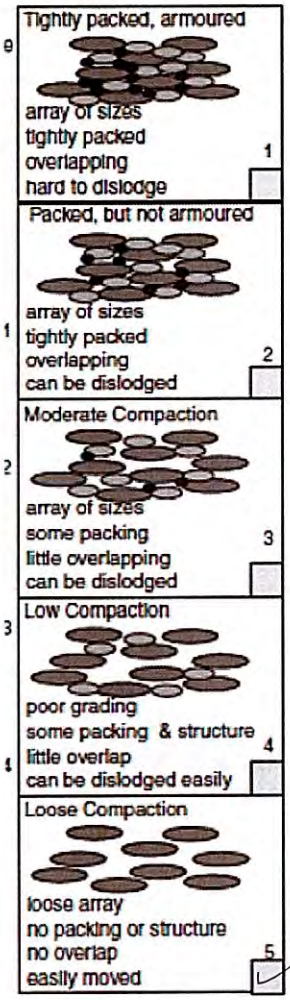
4 LEFT BANK Shape (RANK types)



9 RIGHT BANK Shape (RANK types)



5 Bed Compaction

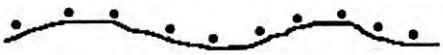
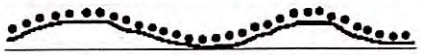


Riparian Zone Structure

Left Bank	
Width (m)	5
Bare (%)	–
Grasses (%)	15
Shrubs (%)	15
Trees <10 m high (%)	10
Trees >10 m high (%)	30
Exotics (%)	30

Right Bank	
Width (m)	5
Bare (%)	
Grasses (%)	15
Shrubs (%)	15
Trees <10 m high (%)	10
Trees >10 m high (%)	30
Exotics (%)	30

Longitudinal Extent of Riparian Vegetation

Category	Description	Category	Description
None	 No trees or shrubs, only exotic grasses or pasture	Occasional clumps	 Clumps of tree among exotic grasses and pastures
Isolated/scattered	 Isolated trees or shrubs among exotic grasses or pasture	Semi-contiguous	 Cleared patches of trees
Regularly space	 Evenly spaced trees among exotic grasses and pastures	Contiguous	 Intact tree line

Comments

Highly overgrown with paragrass in channel and around pools. Some slow observed upstream. P/S composed of large pools choked with macrophytes (mainly Ceratophyllum + algae). Anoxic smell from water + sediment. Density of vegetation reduced egress/access + E-W flushing. Higher habitat diversity compared to other sites → [WD, undercut banks + root masses

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Site Details

Site Number	AB6
Watercourse	
Date (DD/MM/YYYY)	
Time (24 hrs)	12:00

Site Name	
Collector (initials)	
Project Code	

Edge/Backwater: Yes ☐ No ☐ QA/QC Residue Yes ☐ No ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1		JH	JH	AB6 - Edge	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.8	**Substrate Description (% cover)**			
Mean Wetted Width (m)	10	Bedrock	—	Gravel (2-4 mm)	—
Method: Sweep		Boulder (>256 mm)	—	Sand (0.05- 2 mm)	—
Canopy cover (%)	10	Cobble (64-256 mm)	—	Silt/Clay (<0.05 mm)	100
Shading (%)	10	Pebble (4 – 64 mm)	—		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	20	Periphyton	5	Bank overhang veg	
Sticks (<2 cm diam)	20	Moss	0	Trailing bank veg	15
Branches (<15 cm diam)	5	Filamentous algae	5	Blanketing Silt	—
Logs (>15 cm diam)	5	Macrophytes	40	Substrate anoxia	—

Comments

Taken from pool with dense ceratophyllum, higher habitat diversity than previous ⇒ Included undercut banks + root masses + logs

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Bed: Yes ☑ No ☐ Collected by: [|] Picked by: [|] No. vials/reps: [ ] QA/QC Residue Yes ☐ No ☐

Type: Riffle ☐ Run ☐ Pool (rocky/gravel) ☐ Pool (sandy/silt) ☑

Rep	No Vials	Collected by	Picked by	Label	Comment
1		JH	JH	AB6 - Bet	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.8	**Substrate Description (% cover)**			
Mean Wetted Width (m)	10	Bedrock		Gravel (2-4 mm)	
Method:		Boulder (>256 mm)		Sand (0.05- 2 mm)	
Canopy cover (%)	0	Cobble (64-256 mm)		Silt/Clay (<0.005 mm)	100
Shading (%)	0	Pebble (4 – 64 mm)			
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	20	Periphyton	0	Bank overhang veg	0
Sticks (<2 cm diam)	5	Moss	0	Trailing bank veg	0
Branches (<15 cm diam)	5	Filamentous algae	0	Blanketing Silt	–
Logs (>15 cm diam)	0	Macrophytes	10	Substrate anoxia	Y.L

Comments

Boggy – lots of debris + decaying veg.
Taken from pool w/ dense ceratophyllum

Hydrobiology

Site Details

Site Number	AB1
Watercourse	
Date (DD/MM/YYYY)	3/2/23
Time (24 hrs)	16:00

Site Name	
Collector (initials):	Project Code:
Drone footage time:	length:

Observations

Left Bank land use: Native	Algae on substrate % cover: 10
Left Bank erosion (%): —	Algae in water column % cover: 10
Right Bank land use: Native	Flow level: ☑ None ☐ Low ☐ Moderate ☐ High ☐ Flood
Right Bank erosion %: —	Local catchment erosion %: —
Point Source Discharges ☐ yes ☑ no	Sediment Odour ☐ yes ☑ no, Specify .....
Sediment Deposits ☐ None ☐ Sand ☐ Silt	Water Odour ☐ yes ☑ no, Specify .....
Bars (bed surface protruding from normal water level) %: —	

Macrohabitat

Cover	Value (%)
Riffle (%)	—
Run (%)	—
Pool (rocky) (%)	100
Pool (sandy/silt) (%)	—
Dry (%)	—

Microhabitat

Cover	Value (%)
LWD (>15 cm dia)	10
SWD (<15 cm dia)	10
Detritus	10
Periphyton	10
Blanketing Silt	—
Undercut Banks	20

Substrate Description

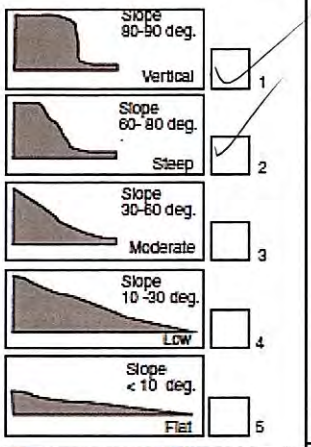
Cover	Value (%)
Bedrock	10
Boulder (>256 mm)	10
Cobble (64-256 mm)	30
Pebble (4-64 mm)	30
Gravel (2-4 mm)	10
Sand (0.05 -2 mm)	5
Silt/Clay (<0.05 mm)	5

Macrophytes and Algae

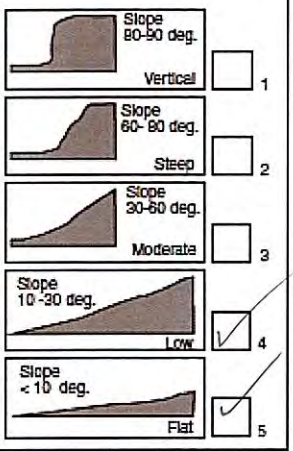
Primary Production	In
Macrophyte % [40]	Edge % [50]
	Run % [ ]
	Riffle % [ ]
	Pool (rocky) % [50]
Algae % [20]	Edge % [10]
	Run % [ ]
	Riffle % [ ]
	Pool (rocky) % [10]

Macrophyte Botanical Name	Value (%)
1. Typha	
2. Ludwigia	
3. Cyperus	
4. Myriophyllum	? 10
5 Ceratophyllum	
6 Acorus	
7 Lemna	
8.	

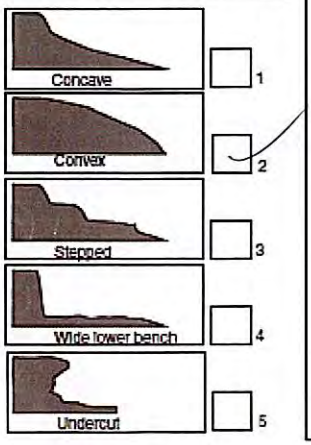
3 LEFT BANK Slope (RANK types)



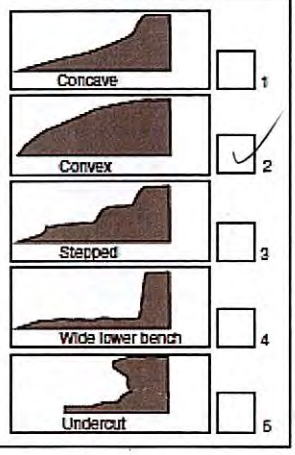
8 RIGHT BANK Slope (RANK types)



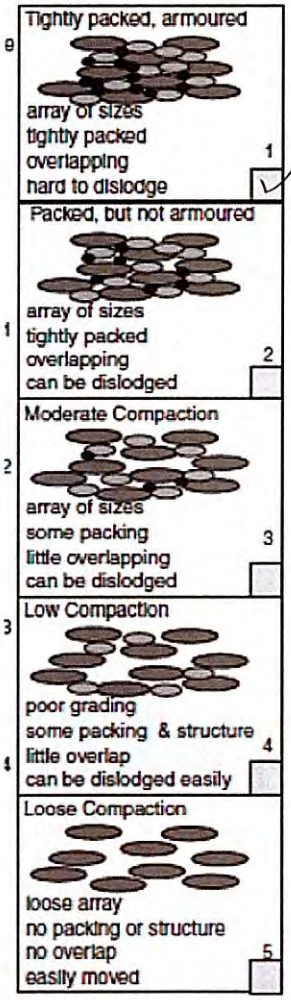
4 LEFT BANK Shape (RANK types)



9 RIGHT BANK Shape (RANK types)



5 Bed Compaction



Riparian Zone Structure

Left Bank	
Width (m)	20
Bare (%)	—
Grasses (%)	20
Shrubs (%)	20
Trees <10 m high (%)	10
Trees >10 m high (%)	40
Exotics (%)	10

Right Bank	
Width (m)	10
Bare (%)	—
Grasses (%)	20
Shrubs (%)	20
Trees <10 m high (%)	10
Trees >10 m high (%)	40
Exotics (%)	10

Longitudinal Extent of Riparian Vegetation

Category	Description	Category	Description
None	No trees or shrubs, only exotic grasses or pasture	Occasional clumps	Clumps of tree among exotic grasses and pastures
Isolated/scattered	Isolated trees or shrubs among exotic grasses or pasture	Semi-contiguous	Cleared patches of trees
Regularly space	Evenly spaced trees among exotic grasses and pastures	Contiguous	Intact tree line

Comments

Intact reach, varied habitat, rocky substrate, highly armoured. Undercut banks, LWD, exposed bedrock on banks. Visible periphyton, edge habitat includes standing veg + macrophytes but not much debris → water level recently changed. Visible high fish activity. High O_2. Hygrorhiza starting to colonise (bright green)

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Site Details

Site Number	AB1
Watercourse	
Date (DD/MM/YYYY)	3/2/23
Time (24 hrs)	16:00

Site Name	
Collector (initials)	
Project Code	

Edge/Backwater: Yes ☑ No ☐ QA/QC Residue Yes ☐ No ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1		JH	JH	AB1-Edge	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)	0.4	**Substrate Description (% cover)**			
Mean Wetted Width (m)	30	Bedrock	—	Gravel (2-4 mm)	—
Method: Sweep		Boulder (>256 mm)	—	Sand (0.05- 2 mm)	—
Canopy cover (%)	0	Cobble (64-256 mm)	80	Silt/Clay (<0.05 mm)	10
Shading (%)	10	Pebble (4 – 64 mm)	10		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)		Periphyton	10	Bank overhang veg	—
Sticks (<2 cm diam)		Moss	—	Trailing bank veg	30
Branches (<15 cm diam)		Filamentous algae	5	Blanketing Silt	—
Logs (>15 cm diam)		Macrophytes	30	Substrate anoxia	

Comments

Edge of macrophytes + submerged grasses / trailing veg. Not much debris

Hydrobiology

MACROINVERTEBRATE SAMPLING FIELD SHEET

Bed: Yes ☑ No ☐ Collected by: [|] Picked by: [|] No. vials/reps: [ ] QA/QC Residue Yes ☐ No ☐

Type: Riffle ☐ Run ☐ Pool (rocky/gravel) ☑ Pool (sandy/silt) ☐

Rep	No Vials	Collected by	Picked by	Label	Comment
1		JH	JH	ABI-Bed	
2					
3					
4					
5					

Variables

Mean Sample Depth (m)		**Substrate Description (% cover)**			
Mean Wetted Width (m)		Bedrock	—	Gravel (2-4 mm)	—
Method:		Boulder (>256 mm)	10	Sand (0.05- 2 mm)	—
Canopy cover (%)		Cobble (64-256 mm)	30	Silt/Clay (<0.005 mm)	20
Shading (%)		Pebble (4 – 64 mm)	40		
Snags and LWD (% cover)		**Microhabitat Attributes (% cover)**			
Detritus (leaves & twigs)	10	Periphyton	5	Bank overhang veg	
Sticks (<2 cm diam)	—	Moss	0	Trailing bank veg	
Branches (<15 cm diam)	—	Filamentous algae	5	Blanketing Silt	
Logs (>15 cm diam)	—	Macrophytes	20	Substrate anoxia	

Comments

highly armoured, rocky

Hydrobiology

APPENDIX D. WATER QUALITY DATA



Table 5-8 In-situ water quality data provided by client.

Site	Sample date	Temp (°C)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH
AB9	15/09/2022	20.9	67.4	6.01	547	8.03
AB1	28/02/2023	29.3	67.7	5.2	377	8.65
AB2	27/02/2023	31	72.8	5.34	454	8.87
AB3	28/02/2023	31	72.8	5.34	454	8.87
AB4	28/02/2023	31.5	50.6	3.67	2631	8.25
AB5	7/03/2023	30.4	35.7	2.68	215	7.74
AB6	no result					
AB7	26/10/2022	24	17.40%	1.46	720	6.78
AB8	6/03/2023	34.2	29.7	2.09	672	7.6

Site AB6 was dry during previous attempts for water sampling

APPENDIX E. TABULATED DATA



Sample number				AB1-AA-WB	AB1-CS-WB	AB1-NH-EP	AB1-MS-WB	AB1-PR-EP	AB1-CQ-EP	AB1-OL-EP	AB1-TT-EP	AB1-MA-EP
Date sampled				4/02/2023	4/02/2023	4/02/2023	4/02/2023	2/02/2023	4/02/2023	4/02/2023	4/02/2023	4/02/2023
Species				Ambassis agassizii	Craterocephalus stercusmuscarum	Neosilurus hyrtlii	Macrobrachium sp.	Porochilus rendahli	Cherax quadricarinatus	Oxyeleotris lineolata	Tandanus tandanus	Macquaria ambigua
Common name				Agassiz's perchlet	Flyspecked Hardyhead	Hyrtl's Catfish	Freshwater prawn	Rendahl's Catfish	Crayfish	Sleepy cod	Eeltail Catfish	Yellowbelly
Site				AB1	AB1	AB1	AB1	AB1	AB1	AB1	AB1	AB1
System				Callide Creek U/S	Callide Creek U/S	Callide Creek U/S	Callide Creek U/S	Callide Creek U/S	Callide Creek U/S	Callide Creek U/S	Callide Creek U/S	Callide Creek U/S
Condition				Control	Control	Control	Control	Control	Control	Control	Control	Control
Assessment				Ecological health	Ecological health	Human health	Ecological health	Human health	Human health	Human health	Human health	Human health
Tissue analysed				Whole body	Whole body	Edible portion	Whole body	Edible portion	Edible portion	Edible portion	Edible portion	Edible portion
	Unit	LOR	Screening criteria									
Weight	g	0.1	-	7.9	13	141	3.4	7.7	63	535	238	1150
Arsenic	mg/kg	0.05	-	0.2	0.21	0.07	0.55	0.05	0.5	0.06	0.12	0.06
Barium	mg/kg	0.1	-	6.1	7.4	<0.1	30.4	0.7	47.5	<0.1	0.2	<0.1
Boron	mg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chromium	mg/kg	0.05	-	0.79	0.18	<0.05	0.15	2.44	2.41	<0.05	<0.05	<0.05
Copper	mg/kg	0.1	20/2*	1.2	0.6	0.3	23.8	1.2	15.7	1.1	0.7	0.3
Molybdenum	mg/kg	0.05	-	0.1	<0.05	<0.05	<0.05	0.35	0.33	<0.05	<0.05	<0.05
Selenium	mg/kg	0.05	1/2*	0.25	0.17	0.22	0.22	0.16	0.07	0.17	0.26	0.44
Strontium	mg/kg	0.1	-	95.6	93.6	0.8	121	54.3	134	0.6	1.9	0.5
Uranium	mg/kg	0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Sample number				AB1-AA-WB	AB1-CS-WB	AB1-NH-EP	AB1-MS-WB	AB1-PR-EP	AB1-CQ-EP	AB1-OL-EP	AB1-TT-EP	AB1-MA-EP
Vanadium	mg/kg	0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	mg/kg	0.5	40/15*	48.6	66.7	12.4	44.5	39.5	15.3	7.2	6.1	10.1
Perfluorobutane sulfonic acid (PFBS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	µg/kg	1	-	<1	<1	<1	<1	2	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	µg/kg	1	-	<1	<1	<1	<1	2	<1	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorobutanoic acid (PFBA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	µg/kg	1	11.2**	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1

Sample number				AB1-AA-WB	AB1-CS-WB	AB1-NH-EP	AB1-MS-WB	AB1-PR-EP	AB1-CQ-EP	AB1-OL-EP	AB1-TT-EP	AB1-MA-EP
Perfluorododecanoic acid (PFDoDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorooctane sulfonamide (FOSA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Sum of PFAS	µg/kg	1	-	<1	<1	<1	<1	2	<1	<1	<1	<1
Sum of PFHxS and PFOS	µg/kg	1	1.4/4.6/8.2***	<1	<1	<1	<1	2	<1	<1	<1	<1
Lithium	mg/kg	0.2	-	<0.2	<0.2	<0.2	----	<0.2	<0.2	<0.2	<0.2	<0.2
Thorium	mg/kg	0.01	-	<0.01	<0.01	<0.01	----	<0.01	<0.01	<0.01	<0.01	<0.01

Sample number				AB1-AA-WB	AB1-CS-WB	AB1-NH-EP	AB1-MS-WB	AB1-PR-EP	AB1-CQ-EP	AB1-OL-EP	AB1-TT-EP	AB1-MA-EP
Fluoride	mg/kg	0.2	-	----	----	<0.2	----	----	----	<0.2	<0.2	<0.2

Sample number				AB2-LC-EP	AB2-CS-WB	AB2-MP-WB	AB2-CQ-EP	AB2-CQ-RB	AB2-TT-EP	AB3-LC-EP	AB3-LC-RB	AB3-AA-WB
Date sampled				30/01/2023	31/01/2023	31/01/2023	31/01/2023	30/01/2023	30/01/2023	30/01/2023	30/01/2023	31/01/2023
Species				Lates calcarifer	Craterocephalus stercusmuscarum	Macrobrachium sp.	Cherax quadricarinatus	Cherax quadricarinatus	Tandanus tandanus	Lates calcarifer	Lates calcarifer	Ambassis agassizii
Common name				Barramundi	Flyspecked Hardyhead	Freshwater prawn	Crayfish	Crayfish	Eeltail Catfish	Barramundi	Barramundi	Agassiz's perchlet
Site				AB2	AB2	AB2	AB2	AB2	AB2	AB3	AB3	AB3
System				Lake Callide	Lake Callide	Lake Callide	Lake Callide	Lake Callide	Lake Callide	Lake Callide	Lake Callide	Lake Callide
Condition				Test	Test	Test	Test	Test	Test	Test	Test	Test
Assessment				Human health	Ecological health	Ecological health	Human health	Human health	Human health	Human health	Human health	Ecological health
Tissue analysed				Edible portion	Whole body	Whole body	Edible portion	Rest of body	Edible portion	Edible portion	Rest of body	Whole body
	Unit	LOR	Screening criteria									
Weight	g	0.1	-	11200	6	1.3	10	10	85	10600	10600	8
Arsenic	mg/kg	0.05	-	0.08	0.22	----	0.28	0.27	0.16	0.09	0.06	0.16
Barium	mg/kg	0.1	-	0.1	5.5	----	2.3	2.1	0.7	<0.1	<0.1	3.8
Boron	mg/kg	5	-	<5	<5	----	<5	<5	<5	<5	<5	<5
Chromium	mg/kg	0.05	-	<0.05	0.26	----	0.13	0.14	6.85	<0.05	<0.05	0.22
Copper	mg/kg	0.1	20/2*	0.4	0.6	----	8.1	7.1	1.6	0.4	0.3	0.8
Molybdenum	mg/kg	0.05	-	<0.05	<0.05	----	<0.05	<0.05	0.77	<0.05	<0.05	0.05
Selenium	mg/kg	0.05	1/2*	0.16	0.14	----	0.08	0.08	0.15	0.2	0.18	0.26
Strontium	mg/kg	0.1	-	1.1	104	----	24.9	24.5	2	0.9	0.6	93.5
Uranium	mg/kg	0.01	-	<0.01	<0.01	----	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	mg/kg	0.5	-	<0.5	<0.5	----	<0.5	<0.5	1.8	<0.5	<0.5	<0.5
Zinc	mg/kg	0.5	40/15*	5.6	82.6	----	18.8	16.9	6.7	5.7	5.1	41.3
Perfluorobutane sulfonic acid (PFBS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1

Sample number				AB2-LC-EP	AB2-CS-WB	AB2-MP-WB	AB2-CQ-EP	AB2-CQ-RB	AB2-TT-EP	AB3-LC-EP	AB3-LC-RB	AB3-AA-WB
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorobutanoic acid (PFBA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	µg/kg	1	11.6**	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorooctane sulfonamide (FOSA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2

Sample number				AB2-LC-EP	AB2-CS-WB	AB2-MP-WB	AB2-CQ-EP	AB2-CQ-RB	AB2-TT-EP	AB3-LC-EP	AB3-LC-RB	AB3-AA-WB
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Sum of PFAS	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sum of PFHxS and PFOS	µg/kg	1	1.4/4.6/8.2***	<1	<1	<1	<1	<1	<1	<1	<1	<1
Lithium	mg/kg	0.2	-	<0.2	<0.2	----	<0.2	----	<0.2	<0.2	----	<0.2
Thorium	mg/kg	0.01	-	0.018	<0.01	----	<0.01	----	0.022	<0.01	----	<0.01
Fluoride	mg/kg	0.2	-	<0.2		----		----	<0.2	<0.2	----	----

Sample number				AB3-CS-WB	AB3-MS-WB	AB3-CQ-EP	AB4-AT-WB	AB4-AA-WB	AB4-CS-WB	AB4-PR-EP	AB4-OL-EP	AB4-TT-EP
Date sampled				31/01/2023	31/01/2023	31/01/2023	2/02/2023	2/02/2023	2/02/2023	2/02/2023	2/02/2023	2/02/2023
Species				Craterocephalus stercusmuscarum	Macrobrachium sp.	Cherax quadricarinatus	Atyidae	Ambassis agassizii	Craterocephalus stercusmuscarum	Porochilus rendahli	Oxyeleotris lineolata	Tandanus tandanus
Common name				Flyspecked Hardyhead	Freshwater prawn	Crayfish	Freshwater shrimp	Agassiz's perchlet	Flyspecked Hardyhead	Rendahl's Catfish	Sleepy cod	Eeltail Catfish
Site				AB3	AB3	AB3	AB4	AB4	AB4	AB4	AB4	AB4
System				Lake Callide	Lake Callide	Lake Callide	Callide Creek D/S	Callide Creek D/S	Callide Creek D/S	Callide Creek D/S	Callide Creek D/S	Callide Creek D/S
Condition				Test	Test	Test	Test	Test	Test	Test	Test	Test
Assessment				Ecological health	Ecological health	Human health	Ecological health	Ecological health	Ecological health	Human health	Human health	Human health
Tissue analysed				Whole body	Whole body	Edible portion	Whole body	Whole body	Whole body	Edible portion	Edible portion	Edible portion
	Unit	LOR	Screening criteria									
Weight	g	0.1	-	27	16	121	1.9	3	2.2	2.4	5.1	112
Arsenic	mg/kg	0.05	-	0.22	0.42	0.4	----	----	0.51	----	----	0.16
Barium	mg/kg	0.1	-	2.4	4.4	1.3	----	----	12.9	----	----	<0.1
Boron	mg/kg	5	-	<5	<5	<5	----	----	<5	----	----	<5
Chromium	mg/kg	0.05	-	1.4	0.45	0.22	----	----	0.12	----	----	<0.05
Copper	mg/kg	0.1	20/2*	0.6	17.6	13	----	----	0.7	----	----	0.2
Molybdenum	mg/kg	0.05	-	0.18	0.07	0.05	----	----	<0.05	----	----	<0.05
Selenium	mg/kg	0.05	1/2*	0.2	0.18	0.09	----	----	0.18	----	----	0.12
Strontium	mg/kg	0.1	-	52.1	106	17.6	----	----	109	----	----	0.5
Uranium	mg/kg	0.01	-	<0.01	<0.01	<0.01	----	----	<0.01	----	----	<0.01
Vanadium	mg/kg	0.5	-	<0.5	<0.5	<0.5	----	----	<0.5	----	----	<0.5
Zinc	mg/kg	0.5	40/15*	53.8	24.6	20	----	----	96.5	----	----	5.2
Perfluorobutane sulfonic acid (PFBS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	1

Sample number				AB3-CS-WB	AB3-MS-WB	AB3-CQ-EP	AB4-AT-WB	AB4-AA-WB	AB4-CS-WB	AB4-PR-EP	AB4-OL-EP	AB4-TT-EP
Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	µg/kg	1	-	<1	<1	<1	3	7	<1	14	1	3
Perfluorooctane sulfonic acid (PFOS) - Branched	µg/kg	1	-	<1	<1	<1	<1	3	<1	2	<1	1
Perfluorooctane sulfonic acid (PFOS)	µg/kg	1	-	<1	<1	<1	3	10	<1	16	1	4
Perfluorodecane sulfonic acid (PFDS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorobutanoic acid (PFBA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	µg/kg	1	11.2**	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorooctane sulfonamide (FOSA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2

Sample number				AB3-CS-WB	AB3-MS-WB	AB3-CQ-EP	AB4-AT-WB	AB4-AA-WB	AB4-CS-WB	AB4-PR-EP	AB4-OL-EP	AB4-TT-EP
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Sum of PFAS	µg/kg	1	-	<1	<1	<1	3	10	<1	16	1	5
Sum of PFHxS and PFOS	µg/kg	1	1.4/4.6/8.2***	<1	<1	<1	3	10	<1	16	1	5
Lithium	mg/kg	0.2	-	<0.2	<0.2	<0.2	----	----	----	----	<0.2	<0.2
Thorium	mg/kg	0.01	-	<0.01	<0.01	<0.01	----	----	----	----	<0.01	<0.01
Fluoride	mg/kg	0.2	-	----	----	6.3	----	----	----	----		<0.2

Sample number				AB5-AA-WB	AB5-PR-EP	AB7-AT-WB	AB7-AA-WB	AB7-CS-WB	AB8-AA-WB	AB8-CS-WB	AB8-NH-EP	AB8-MA-EP
Date sampled				2/02/2023	2/02/2023	3/02/2023	3/02/2023	3/02/2023	1/02/2023	1/02/2023	1/02/2023	1/02/2023
Species				Ambassis agassizii	Porochilus rendahli	Atyidae	Ambassis agassizii	Craterocephalus stercusmuscarum	Ambassis agassizii	Craterocephalus stercusmuscarum	Neosilurus hyrtlii	Macquaria ambigua
Common name				Agassiz's perchlet	Rendahl's Catfish	Freshwater shrimp	Agassiz's perchlet	Flyspecked Hardyhead	Agassiz's perchlet	Flyspecked Hardyhead	Hyrtl's Catfish	Yellowbelly
Site				AB5	AB5	AB7	AB7	AB7	AB8	AB8	AB8	AB8
System				Callide Creek D/S	Callide Creek D/S	Callide Creek D/S	Callide Creek D/S	Callide Creek D/S	Callide Creek D/S	Callide Creek D/S	Callide Creek D/S	Callide Creek D/S
Condition				Test	Test	Test	Test	Test	Test	Test	Test	Test
Assessment				Ecological health	Human health	Ecological health	Ecological health	Ecological health	Ecological health	Ecological health	Human health	Human health
Tissue analysed				Whole body	Edible portion	Whole body	Whole body	Whole body	Whole body	Whole body	Edible portion	Edible portion
	Unit	LOR	Screening criteria									
Weight	g	0.1	-	0.9	39	1.2	1.4	0.6	15	17	13	154
Arsenic	mg/kg	0.05	-	----	0.06	----	----	----	0.15	0.2	<0.05	0.06
Barium	mg/kg	0.1	-	----	1.2	----	----	----	6	5.6	0.3	1
Boron	mg/kg	5	-	----	<5	----	----	----	<5	<5	<5	<5
Chromium	mg/kg	0.05	-	----	1.76	----	----	----	0.48	0.25	<0.05	<0.05
Copper	mg/kg	0.1	20/2*	----	1	----	----	----	0.6	0.5	0.3	0.4
Molybdenum	mg/kg	0.05	-	----	0.24	----	----	----	0.09	0.05	<0.05	<0.05
Selenium	mg/kg	0.05	1/2*	----	0.1	----	----	----	0.13	0.11	0.21	0.52
Strontium	mg/kg	0.1	-	----	55.5	----	----	----	82.6	79.6	7.6	27
Uranium	mg/kg	0.01	-	----	<0.01	----	----	----	<0.01	<0.01	<0.01	<0.01
Vanadium	mg/kg	0.5	-	----	<0.5	----	----	----	<0.5	<0.5	<0.5	<0.5

Sample number				AB5-AA-WB	AB5-PR-EP	AB7-AT-WB	AB7-AA-WB	AB7-CS-WB	AB8-AA-WB	AB8-CS-WB	AB8-NH-EP	AB8-MA-EP
Zinc	mg/kg	0.5	40/15*	----	49.2	----	----	----	40.2	50	14.1	9.8
Perfluorobutane sulfonic acid (PFBS)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	µg/kg	1	-	35	42	28	66	30	82	64	7	4
Perfluorooctane sulfonic acid (PFOS) - Branched	µg/kg	1	-	5	2	3	18	10	7	4	1	1
Perfluorooctane sulfonic acid (PFOS)	µg/kg	1	-	40	44	31	84	40	89	68	8	5
Perfluorodecane sulfonic acid (PFDS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorobutanoic acid (PFBA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	µg/kg	1	11.2**	<1	<1	<1	<1	<2	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	2	-	<2	<2	<2	<2	<6	<2	<2	<2	<2

Sample number				AB5-AA-WB	AB5-PR-EP	AB7-AT-WB	AB7-AA-WB	AB7-CS-WB	AB8-AA-WB	AB8-CS-WB	AB8-NH-EP	AB8-MA-EP
Perfluorooctane sulfonamide (FOSA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	5	-	<5	<5	<5	<5	<6	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	2	-	<2	<2	<2	<2	<6	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/kg	2	-	<2	<2	<2	<2	<6	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/kg	2	-	<2	<2	<2	<2	<6	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<2	<1	<1	<1	<1
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Sum of PFAS	µg/kg	1	-	40	44	31	84	40	89	68	8	5
Sum of PFHxS and PFOS	µg/kg	1	1.4/4.6/8.2***	40	44	31	84	40	89	68	8	5
Lithium	mg/kg	0.2	-	----	<0.2	----	----	----	<0.2	<0.2	<0.2	<0.2
Thorium	mg/kg	0.01	-	----	<0.01	----	----	----	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/kg	0.2	-	----	----	----	----	----	----	----	----	3.5

Sample number				AB8-MA-RB	AB9-AA-WB	AB9-NH-EP	AB9-MS-WB	AB9-TT-EP	AB2-LC-DU
Date sampled				30/01/2023	1/02/2023	1/02/2023	1/02/2023	1/02/2023	30/01/2023
Species				Macquaria ambigua	Ambassis agassizii	Neosilurus hyrtlii	Macrobrachium sp.	Tandanus tandanus	Lates calcarifer
Common name				Yellowbelly	Agassiz's perchlet	Hyrtl's Catfish	Freshwater prawn	Eeltail Catfish	Barramundi
Site				AB8	AB9	AB9	AB9	AB9	AB2
System				Callide Creek D/S	Lake Kroombit	Lake Kroombit	Lake Kroombit	Lake Kroombit	Lake Callide
Condition				Test	Reference	Reference	Reference	Reference	Test
Assessment				Human health	Ecological health	Human health	Ecological health	Human health	Human health
Tissue analysed				Rest of body	Whole body	Edible portion	Whole body	Edible portion	Edible portion
	Unit	LOR	Screening criteria						
Weight	g	0.1	-	154	19	15	4.3	12.5	11200
Arsenic	mg/kg	0.05	-	0.06	0.17	<0.05	0.33	<0.05	0.07
Barium	mg/kg	0.1	-	0.2	1.6	<0.1	19.2	0.2	<0.1
Boron	mg/kg	5	-	<5	<5	<5	<5	<5	<5
Chromium	mg/kg	0.05	-	<0.05	0.09	0.6	0.42	<0.05	<0.05
Copper	mg/kg	0.1	20/2*	0.4	0.5	0.4	16.7	0.3	0.3
Molybdenum	mg/kg	0.05	-	<0.05	<0.05	0.07	0.06	<0.05	<0.05
Selenium	mg/kg	0.05	1/2*	0.49	0.2	0.14	0.22	0.12	0.18
Strontium	mg/kg	0.1	-	6.2	41.6	1	78.4	0.5	0.8
Uranium	mg/kg	0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	mg/kg	0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	mg/kg	0.5	40/15*	7.5	34.9	11.5	29.8	7	4.9
Perfluorobutane sulfonic acid (PFBS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	1	-	<1	<1	<1	<1	<1	<1

Sample number				AB8-MA-RB	AB9-AA-WB	AB9-NH-EP	AB9-MS-WB	AB9-TT-EP	AB2-LC-DU
Perfluorooctane sulfonic acid (PFOS) - Linear	µg/kg	1	-	4	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	µg/kg	1	-	2	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	µg/kg	1	-	6	<1	<1	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
Perfluorobutanoic acid (PFBA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	µg/kg	1	11.2**	<1	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
Perfluorooctane sulfonamide (FOSA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	5	-	<5	<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<1	<1
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2

Sample number				AB8-MA-RB	AB9-AA-WB	AB9-NH-EP	AB9-MS-WB	AB9-TT-EP	AB2-LC-DU
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2	<2
Sum of PFAS	µg/kg	1	-	6	<1	<1	<1	<1	<1
Sum of PFHxS and PFOS	µg/kg	1	1.4/4.6/8.2***	6	<1	<1	<1	<1	<1
Lithium	mg/kg	0.2	-	----	<0.2	<0.2	<0.2	<0.2	-
Thorium	mg/kg	0.01	-	----	<0.01	<0.01	0.022	<0.01	-
Fluoride	mg/kg	0.2	-	----	----	----	----	----	-

Sample number				AB3-CS-DU	AB9-NH-DU	AB1-MA-DU	AB1-MA-TR	AB1-NH-TR
Date sampled				30/01/2023	30/01/2023	30/1/2023	30/1/2023	30/01/2023
Species				Craterocephalus stercusmuscarum	Neosilurus hyrtlii	Macquaria ambigua	Macquaria ambigua	Neosilurus hyrtlii
Common name				Flyspecked Hardyhead	Hyrtl's Catfish	Yellowbelly	Yellowbelly	Hyrtl's Catfish
Site				AB3	AB9	AB1	AB1	AB1
System				Lake Callide	Lake Kroombit	Callide Creek U/S	Callide Creek U/S	Callide Creek U/S
Condition				Test	Reference	Control	Control	Control
Assessment				Ecological health	Human health	Human health	Human health	Human health
Tissue analysed				Whole body	Edible portion	Edible portion	Edible portion	Edible portion
	Unit	LOR	Screening criteria					
Weight	g	0.1	-	27	15	1150	-	-
Arsenic	mg/kg	0.05	-	0.24	<0.05	0.05	< 2	< 2
Barium	mg/kg	0.1	-	2.8	0.2	<0.1	< 10	< 10
Boron	mg/kg	5	-	<5	<5	<5	< 10	< 25
Chromium	mg/kg	0.05	-	1.44	0.55	<0.05	< 5	< 5

Sample number				AB3-CS-DU	AB9-NH-DU	AB1-MA-DU	AB1-MA-TR	AB1-NH-TR
Copper	mg/kg	0.1	20/2*	0.6	0.4	0.3	< 5	< 5
Molybdenum	mg/kg	0.05	-	0.2	0.07	<0.05	< 5	< 5
Selenium	mg/kg	0.05	1/2*	0.21	0.13	0.4	< 2	< 2
Strontium	mg/kg	0.1	-	61.3	5.9	0.4	< 10	< 10
Uranium	mg/kg	0.01	-	<0.01	<0.01	<0.01	< 10	< 10
Vanadium	mg/kg	0.5	-	<0.5	<0.5	<0.5	< 10	< 10
Zinc	mg/kg	0.5	40/15*	54.3	15.6	9.3	7.8	10
Perfluorobutane sulfonic acid (PFBS)	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	µg/kg	2	-	<2	<2	<2	<2	<2
Perfluorobutanoic acid (PFBA)	µg/kg	5	-	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	µg/kg	2	-	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	µg/kg	1	11.2**	<1	<1	<1	<1	<1

Sample number				AB3-CS-DU	AB9-NH-DU	AB1-MA-DU	AB1-MA-TR	AB1-NH-TR
Perfluorononanoic acid (PFNA)	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	µg/kg	1	-	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	µg/kg	2	-	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	µg/kg	2	-	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	2	-	<2	<2	<2	<2	<2
Perfluorooctane sulfonamide (FOSA)	µg/kg	5	-	<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	5	-	<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	2	-	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/kg	2	-	<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/kg	2	-	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/kg	1	-	<1	<1	<1	<1	<1
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2

Sample number				AB3-CS-DU	AB9-NH-DU	AB1-MA-DU	AB1-MA-TR	AB1-NH-TR
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	2	-	<2	<2	<2	<2	<2
Sum of PFAS	µg/kg	1	-	<1	<1	<1	<1	<1
Sum of PFHxS and PFOS	µg/kg	1	1.4/4.6/8.2***	<1	<1	<1	<1	<1
Lithium	mg/kg	0.2	-	-	-	-	-	-
Thorium	mg/kg	0.01	-	-	-	-	-	-
Fluoride	mg/kg	0.2	-	-	-	-	-	-

* Crustacean GEL/ Fish GEL. Units mg/kgbw/day.

** Human health screening value. Units µg/kgbw/day.

***Human health screening value/Mammalian diet/ Avian diet. Units µg/kgbw/day.

APPENDIX F. LABORATORY REPORTS



Hydrobiology QLD Pty Ltd
Unit 27/43 Lang Parade
Auchenflower
QLD 4066

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Josh Hatton**

Report **968084-S**
Project name
Project ID B22096
Received Date Feb 24, 2023

Client Sample ID			**ES2304523-036**
Sample Matrix			**Solid**
Eurofins Sample No.			**B23-Ma0002543**
Date Sampled			**Feb 04, 2023**
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	2	mg/kg	< 2
Barium	10	mg/kg	< 10
Boron	10	mg/kg	< 10
Chromium	5	mg/kg	< 5
Copper	5	mg/kg	< 5
Lithium	5	mg/kg	< 5
Molybdenum	5	mg/kg	< 5
Selenium	2	mg/kg	< 2
Strontium	10	mg/kg	< 10
Thallium	10	mg/kg	< 10
Uranium	10	mg/kg	< 10
Vanadium	10	mg/kg	< 10
Zinc	5	mg/kg	7.8
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5
13C4-PFBA (surr.)	1	%	74
13C5-PFPeA (surr.)	1	%	131
13C5-PFHxA (surr.)	1	%	87
13C4-PFHpA (surr.)	1	%	75
13C8-PFOA (surr.)	1	%	107
13C5-PFNA (surr.)	1	%	124
13C6-PFDA (surr.)	1	%	136
13C2-PFUnDA (surr.)	1	%	115
13C2-PFDoDA (surr.)	1	%	86
13C2-PFTeDA (surr.)	1	%	76

Client Sample ID			ES2304523-036
Sample Matrix			Solid
Eurofins Sample No.			B23-Ma0002543
Date Sampled			Feb 04, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10
13C8-FOSA (surr.)	1	%	28
D3-N-MeFOSA (surr.)	1	%	INT
D5-N-EtFOSA (surr.)	1	%	INT
D7-N-MeFOSE (surr.)	1	%	INT
D9-N-EtFOSE (surr.)	1	%	INT
D5-N-EtFOSAA (surr.)	1	%	118
D3-N-MeFOSAA (surr.)	1	%	119
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5
13C3-PFBS (surr.)	1	%	81
18O2-PFHxS (surr.)	1	%	103
13C8-PFOS (surr.)	1	%	88
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5
13C2-4:2 FTSA (surr.)	1	%	143
13C2-6:2 FTSA (surr.)	1	%	115
13C2-8:2 FTSA (surr.)	1	%	78
13C2-10:2 FTSA (surr.)	1	%	191
PFASs Summations			
Sum (PFHxS + PFOS)*	5	ug/kg	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals	Melbourne	Apr 03, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Mar 01, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Mar 01, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Mar 01, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Mar 01, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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IANZ# 1290

Company Name: Hydrobiology QLD Pty Ltd
Address: Unit 27/43 Lang Parade
Auchenflower
QLD 4066

Project Name:
Project ID: B22096

Order No.:
Report #: 968084
Phone: 0431 647 627
Fax:

Received: Feb 24, 2023 3:47 PM
Due: Mar 3, 2023
Priority: 5 Day
Contact Name: Josh Hatton

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Arsenic	Barium	Boron	Chromium	Copper	Lithium	Molybdenum	Selenium	Strontium	Thallium	Uranium	Vanadium	Zinc	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X	X	X	X	X	X	X	X	X	X	X	X
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	ES2304523-001	Jan 30, 2023		Fish	B23-Ma0002542	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	ES2304523-036	Feb 04, 2023		Fish	B23-Ma0002543	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						2	2	2	2	2	2	2	2	2	2	2	2	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Barium	mg/kg	< 10			10	Pass	
Boron	mg/kg	< 10			10	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lithium	mg/kg	< 5			5	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Strontium	mg/kg	< 10			10	Pass	
Thallium	mg/kg	< 10			10	Pass	
Uranium	mg/kg	< 10			10	Pass	
Vanadium	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	102			80-120	Pass	
Barium	%	101			80-120	Pass	
Boron	%	95			80-120	Pass	
Chromium	%	106			80-120	Pass	
Copper	%	102			80-120	Pass	
Lithium	%	102			80-120	Pass	
Molybdenum	%	109			80-120	Pass	
Selenium	%	103			80-120	Pass	
Strontium	%	96			80-120	Pass	
Thallium	%	120			80-120	Pass	
Uranium	%	114			80-120	Pass	
Vanadium	%	106			80-120	Pass	
Zinc	%	97			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	99			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	94			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	93			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	82			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	85			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	94			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	86			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	92			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	101			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	144			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	74			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	78			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	104			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	72			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	100			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	102			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	101			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	101			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	85			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	87			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	106			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	52			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	100			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	97			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	92			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	74			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	125			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	111			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	126			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M23-Ma0039803	NCP	%	99			75-125	Pass	
Barium	M23-Ma0039803	NCP	%	106			75-125	Pass	
Boron	M23-Ma0041836	NCP	%	80			75-125	Pass	
Chromium	M23-Ma0041836	NCP	%	80			75-125	Pass	
Copper	M23-Ma0041836	NCP	%	81			75-125	Pass	
Lithium	M23-Ma0041836	NCP	%	78			75-125	Pass	
Molybdenum	M23-Ma0041836	NCP	%	82			75-125	Pass	
Selenium	M23-Ma0039803	NCP	%	96			75-125	Pass	
Strontium	M23-Ma0036586	NCP	%	97			75-125	Pass	
Thallium	M23-Ma0041836	NCP	%	80			75-125	Pass	
Uranium	M23-Ma0041836	NCP	%	89			75-125	Pass	
Vanadium	M23-Ma0041836	NCP	%	102			75-125	Pass	
Zinc	M23-Ma0041836	NCP	%	78			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B23-Ma0002543	CP	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Ma0002543	CP	%	97			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Ma0002543	CP	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Ma0002543	CP	%	87			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B23-Ma0002543	CP	%	78			50-150	Pass	
Perfluorononanoic acid (PFNA)	B23-Ma0002543	CP	%	84			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B23-Ma0002543	CP	%	81			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Ma0002543	CP	%	101			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Ma0002543	CP	%	106			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Ma0002543	CP	%	60			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Ma0002543	CP	%	113			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B23-Ma0002543	CP	%	70			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Ma0002543	CP	%	83			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Ma0002543	CP	%	70			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Ma0002543	CP	%	147			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Ma0002543	CP	%	94			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Ma0002543	CP	%	85			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Ma0002543	CP	%	109			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B23-Ma0002543	CP	%	80			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Ma0002543	CP	%	89			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Ma0002543	CP	%	118			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Ma0002543	CP	%	54			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorohexanesulfonic acid (PFHxS)	B23-Ma0002543	CP	%	102			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Ma0002543	CP	%	100			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Ma0002543	CP	%	94			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Ma0002543	CP	%	62			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Ma0002543	CP	%	113			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Ma0002543	CP	%	112			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Ma0002543	CP	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Ma0002543	CP	%	108			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B23-Ma0002543	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Barium	B23-Ma0002543	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Boron	B23-Ma0002543	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Chromium	B23-Ma0002543	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	B23-Ma0002543	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lithium	B23-Ma0002543	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Molybdenum	B23-Ma0002543	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Selenium	B23-Ma0002543	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Strontium	B23-Ma0002543	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Thallium	B23-Ma0002543	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Uranium	B23-Ma0002543	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Vanadium	B23-Ma0002543	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	B23-Ma0002543	CP	mg/kg	7.8	7.8	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Ma0002543	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Ma0002543	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Ma0002543	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Ma0002543	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Hydrobiology QLD Pty Ltd
Unit 27/43 Lang Parade
Auchenflower
QLD 4066

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Josh Hatton**

Report **975237-S**
Project name ES2304523
Received Date Mar 21, 2023

Client Sample ID			**NM1**
Sample Matrix			**Fish**
Eurofins Sample No.			**B23-Ma0059448**
Date Sampled			**Not Provided**[I12]
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	2	mg/kg	< 2
Barium	10	mg/kg	< 10
Boron	10	mg/kg	< 25
Chromium	5	mg/kg	< 5
Copper	5	mg/kg	< 5
Lithium	5	mg/kg	< 5
Molybdenum	5	mg/kg	< 5
Selenium	2	mg/kg	< 2
Strontium	10	mg/kg	< 10
Thallium	10	mg/kg	< 10
Uranium	10	mg/kg	< 10
Vanadium	10	mg/kg	< 10
Zinc	5	mg/kg	10.0
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5
13C4-PFBA (surr.)	1	%	INT
13C5-PFPeA (surr.)	1	%	51
13C5-PFHxA (surr.)	1	%	65
13C4-PFHpA (surr.)	1	%	88
13C8-PFOA (surr.)	1	%	75
13C5-PFNA (surr.)	1	%	89
13C6-PFDA (surr.)	1	%	57
13C2-PFUnDA (surr.)	1	%	85
13C2-PFDoDA (surr.)	1	%	83
13C2-PFTeDA (surr.)	1	%	57

Client Sample ID			NM1
Sample Matrix			Fish
Eurofins Sample No.			B23-Ma0059448
Date Sampled			Not Provided[I12]
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10
13C8-FOSA (surr.)	1	%	34
D3-N-MeFOSA (surr.)	1	%	20
D5-N-EtFOSA (surr.)	1	%	21
D7-N-MeFOSE (surr.)	1	%	INT
D9-N-EtFOSE (surr.)	1	%	INT
D5-N-EtFOSAA (surr.)	1	%	46
D3-N-MeFOSAA (surr.)	1	%	30
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5
13C3-PFBS (surr.)	1	%	62
18O2-PFHxS (surr.)	1	%	75
13C8-PFOS (surr.)	1	%	82
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5
13C2-4:2 FTSA (surr.)	1	%	96
13C2-6:2 FTSA (surr.)	1	%	INT
13C2-8:2 FTSA (surr.)	1	%	191
13C2-10:2 FTSA (surr.)	1	%	14
PFASs Summations			
Sum (PFHxS + PFOS)*	5	ug/kg	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals	Melbourne	Mar 30, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Mar 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Mar 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Mar 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Mar 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Hydrobiology QLD Pty Ltd
Address: Unit 27/43 Lang Parade
Auchenflower
QLD 4066

Project Name: ES2304523

Order No.:
Report #: 975237
Phone: 0431 647 627
Fax:

Received: Mar 21, 2023 11:49 AM
Due: Mar 28, 2023
Priority: 5 Day
Contact Name: ALL INVOICES

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Arsenic	Barium	Boron	Chromium	Copper	Lithium	Molybdenum	Selenium	Strontium	Thallium	Uranium	Vanadium	Zinc	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X	X	X	X	X	X	X	X	X	
Brisbane Laboratory - NATA # 1261 Site # 20794																			X
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	NM1	Not Provided		Fish	B23-Ma0059448	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1	1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Barium	mg/kg	< 10			10	Pass	
Boron	mg/kg	< 10			10	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lithium	mg/kg	< 5			5	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Strontium	mg/kg	< 10			10	Pass	
Thallium	mg/kg	< 10			10	Pass	
Uranium	mg/kg	< 10			10	Pass	
Vanadium	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	101			80-120	Pass	
Barium	%	105			80-120	Pass	
Boron	%	85			80-120	Pass	
Chromium	%	115			80-120	Pass	
Copper	%	114			80-120	Pass	
Lithium	%	110			80-120	Pass	
Molybdenum	%	103			80-120	Pass	
Selenium	%	108			80-120	Pass	
Strontium	%	109			80-120	Pass	
Thallium	%	114			80-120	Pass	
Uranium	%	114			80-120	Pass	
Vanadium	%	111			80-120	Pass	
Zinc	%	102			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	90			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	86			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	56			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	88			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	89			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	99			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	91			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	99			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	103			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	98			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	96			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	95			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	102			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	107			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	105			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	93			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	97			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	95			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	101			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	94			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	106			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	99			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	91			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	87			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	95			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	94			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M23-Ma0072995	NCP	%	89			75-125	Pass	
Barium	M23-Ma0066623	NCP	%	94			75-125	Pass	
Boron	M23-Ma0072995	NCP	%	103			75-125	Pass	
Chromium	M23-Ma0066623	NCP	%	100			75-125	Pass	
Copper	M23-Ma0072995	NCP	%	93			75-125	Pass	
Lithium	M23-Ma0072995	NCP	%	99			75-125	Pass	
Molybdenum	M23-Ma0072995	NCP	%	105			75-125	Pass	
Selenium	M23-Ma0072995	NCP	%	94			75-125	Pass	
Strontium	M23-Ma0066623	NCP	%	105			75-125	Pass	
Thallium	M23-Ma0072995	NCP	%	106			75-125	Pass	
Uranium	M23-Ma0072995	NCP	%	114			75-125	Pass	
Vanadium	M23-Ma0066623	NCP	%	89			75-125	Pass	
Zinc	M23-Ma0066623	NCP	%	84			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B23-Ma0069480	NCP	%	89			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Ma0069480	NCP	%	86			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Ma0069480	NCP	%	89			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Ma0069480	NCP	%	56			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B23-Ma0069480	NCP	%	91			50-150	Pass	
Perfluorononanoic acid (PFNA)	B23-Ma0069480	NCP	%	83			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B23-Ma0069480	NCP	%	104			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Ma0069480	NCP	%	87			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Ma0069480	NCP	%	94			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Ma0069480	NCP	%	100			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Ma0069480	NCP	%	98			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B23-Ma0069480	NCP	%	90			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Ma0069480	NCP	%	94			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Ma0069480	NCP	%	101			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Ma0069480	NCP	%	118			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Ma0069480	NCP	%	99			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Ma0069480	NCP	%	93			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Ma0069480	NCP	%	100			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B23-Ma0069480	NCP	%	85			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Ma0069480	NCP	%	108			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Ma0069480	NCP	%	81			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Ma0069480	NCP	%	88			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorohexanesulfonic acid (PFHxS)	B23-Ma0069480	NCP	%	86			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Ma0069480	NCP	%	79			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Ma0069480	NCP	%	101			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Ma0069480	NCP	%	112			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Ma0069480	NCP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Ma0069480	NCP	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Ma0069480	NCP	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Ma0069480	NCP	%	93			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M23-Ma0067240	NCP	mg/kg	2.5	2.4	2.0	30%	Pass	
Barium	M23-Ma0067240	NCP	mg/kg	200	200	<1	30%	Pass	
Boron	M23-Ma0067240	NCP	mg/kg	< 25	< 25	<1	30%	Pass	
Chromium	M23-Ma0067240	NCP	mg/kg	43	43	<1	30%	Pass	
Copper	M23-Ma0067240	NCP	mg/kg	120	120	<1	30%	Pass	
Lithium	M23-Ma0067240	NCP	mg/kg	13	13	<1	30%	Pass	
Molybdenum	M23-Ma0067240	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Selenium	M23-Ma0067240	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Strontium	M23-Ma0067240	NCP	mg/kg	120	120	1.4	30%	Pass	
Thallium	M23-Ma0067240	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Uranium	M23-Ma0067240	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Vanadium	M23-Ma0067240	NCP	mg/kg	140	140	<1	30%	Pass	
Zinc	M23-Ma0067240	NCP	mg/kg	310	310	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Ma0069479	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Ma0069479	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Ma0069479	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Ma0069479	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	N/A
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Metal
Emily Rosenberg	Senior Analyst-Metal
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2304523**	Page	: 1 of 30
Client	: **HYDROBIOLOGY PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JOSH HATTON	Contact	: Customer Services ES
Address	: 40 TERRIGAL STREET FIG TREE POCKET 4069	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: B22096	Date Samples Received	: 13-Feb-2023 11:00
Order number	: ----	Date Analysis Commenced	: 14-Feb-2023
C-O-C number	: ----	Issue Date	: 09-Mar-2023 15:34
Sampler	: JOSH HATTON		
Site	: ----		
Quote number	: SY/415/22		
No. of samples received	: 47		
No. of samples analysed	: 45		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EG094: Insufficient sample for analysis for samples ES2304523-#012, #021, #025, #026, #027, #028, #29, #38 and #051.
- EP231X (Biota): ALS NATA accreditation for PFAS in Biota covers all Perfluoroalkyl Sulfonic Acids, Perfluoroalkyl Carboxylic Acids and (n:2) Fluorotelomer Sulfonic Acids in fish (whole and muscle), plants and vegetable matrices, with the exception PFBA (fish only), EtFOSA, MeFOSE, EtFOSE, MeFOSAA, EtFOSAA.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB3 Barramundi a	AB2 Barramundi AB2	AB2 Tandanus AB2	AB3 Redclaw AB3	AB2 Redclaw ALS AB2
				Sampling date / time	30-Jan-2023 00:00	30-Jan-2023 00:00	30-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00
					ES2304523-001	ES2304523-002	ES2304523-003	ES2304523-004	ES2304523-006
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø **Sample Description**	----	-	--		**Barramundi**	**Barramundi**	**Tandanus**	**Redclaw**	**Redclaw**
ø **Weight of Sample Prepared**	----	0.1	g		**10600**	**11200**	**85.0**	**121**	**10.0**
EG094: Metals in Biota by ICPMS									
ø **Arsenic**	7440-38-2	0.05	mg/kg		**0.09**	**0.08**	**0.16**	**0.40**	**0.28**
ø **Barium**	7440-39-3	0.1	mg/kg		<0.1	**0.1**	**0.7**	**1.3**	**2.3**
ø **Boron**	7440-42-8	5	mg/kg		<5	<5	<5	<5	<5
ø **Chromium**	7440-47-3	0.05	mg/kg		<0.05	<0.05	**6.85**	**0.22**	**0.13**
ø **Copper**	7440-50-8	0.1	mg/kg		**0.4**	**0.4**	**1.6**	**13.0**	**8.1**
ø **Molybdenum**	7439-98-7	0.05	mg/kg		<0.05	<0.05	**0.77**	**0.05**	<0.05
ø **Selenium**	7782-49-2	0.05	mg/kg		**0.20**	**0.16**	**0.15**	**0.09**	**0.08**
ø **Strontium**	7440-24-6	0.1	mg/kg		**0.9**	**1.1**	**2.0**	**17.6**	**24.9**
ø **Uranium**	7440-61-1	0.01	mg/kg		<0.01	<0.01	<0.01	<0.01	<0.01
ø **Vanadium**	7440-62-2	0.5	mg/kg		<0.5	<0.5	**1.8**	<0.5	<0.5
ø **Zinc**	7440-66-6	0.5	mg/kg		**5.7**	**5.6**	**6.7**	**20.0**	**18.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB3 Barramundi a	AB2 Barramundi AB2	AB2 Tandanus AB2	AB3 Redclaw AB3	AB2 Redclaw ALS AB2
				Sampling date / time	30-Jan-2023 00:00	30-Jan-2023 00:00	30-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00
					ES2304523-001	ES2304523-002	ES2304523-003	ES2304523-004	ES2304523-006
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA** (Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB3 Barramundi a	AB2 Barramundi AB2	AB2 Tandanus AB2	AB3 Redclaw AB3	AB2 Redclaw ALS AB2
				Sampling date / time	30-Jan-2023 00:00	30-Jan-2023 00:00	30-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00
					ES2304523-001	ES2304523-002	ES2304523-003	ES2304523-004	ES2304523-006
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	<1	<1	<1	<1
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	1	µg/kg		<1	<1	<1	<1	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**85.8**	**90.2**	**96.6**	**105**	**102**
13C8-PFOA	----	1	%		**97.2**	**97.9**	**98.2**	**95.4**	**94.6**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB3 Hardyhead AB3	AB3 Glassfish AB3	AB3 Macrobrachium	AB2 Hardyhead AB2	AB2 Macrobrachium AB2
				Sampling date / time	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00
					ES2304523-007	ES2304523-008	ES2304523-009	ES2304523-011	ES2304523-012
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø **Sample Description**	----	-	--		**Hardyhead**	**Glassfish**	**Macrobrachium**	**Hardyhead**	**Macrobrachium**
ø **Weight of Sample Prepared**	----	0.1	g		**27.0**	**8.0**	**16.0**	**6.0**	**1.3**
EG094: Metals in Biota by ICPMS									
ø **Arsenic**	7440-38-2	0.05	mg/kg		**0.22**	**0.16**	**0.42**	**0.22**	**----**
ø **Barium**	7440-39-3	0.1	mg/kg		**2.4**	**3.8**	**4.4**	**5.5**	**----**
ø **Boron**	7440-42-8	5	mg/kg		<5	<5	<5	<5	**----**
ø **Chromium**	7440-47-3	0.05	mg/kg		**1.40**	**0.22**	**0.45**	**0.26**	**----**
ø **Copper**	7440-50-8	0.1	mg/kg		**0.6**	**0.8**	**17.6**	**0.6**	**----**
ø **Molybdenum**	7439-98-7	0.05	mg/kg		**0.18**	**0.05**	**0.07**	<0.05	**----**
ø **Selenium**	7782-49-2	0.05	mg/kg		**0.20**	**0.26**	**0.18**	**0.14**	**----**
ø **Strontium**	7440-24-6	0.1	mg/kg		**52.1**	**93.5**	**106**	**104**	**----**
ø **Uranium**	7440-61-1	0.01	mg/kg		<0.01	<0.01	<0.01	<0.01	**----**
ø **Vanadium**	7440-62-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	**----**
ø **Zinc**	7440-66-6	0.5	mg/kg		**53.8**	**41.3**	**24.6**	**82.6**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB3 Hardyhead AB3	AB3 Glassfish AB3	AB3 Macrobrachium	AB2 Hardyhead AB2	AB2 Macrobrachium AB2
				Sampling date / time	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00
					ES2304523-007	ES2304523-008	ES2304523-009	ES2304523-011	ES2304523-012
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB3 Hardyhead AB3	AB3 Glassfish AB3	AB3 Macrobrachium	AB2 Hardyhead AB2	AB2 Macrobrachium AB2
				Sampling date / time	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00	31-Jan-2023 00:00
					ES2304523-007	ES2304523-008	ES2304523-009	ES2304523-011	ES2304523-012
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	<1	<1	<1	<1
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	1	µg/kg		<1	<1	<1	<1	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**92.6**	**93.6**	**98.8**	**100**	**112**
13C8-PFOA	----	1	%		**93.8**	**90.8**	**94.4**	**99.9**	**102**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB9 Hyrtlii AB9	AB9 Glassfish AB9	AB9 Macrobrachium AB9	AB9 Tandanus AB9	AB8 Hardyhead AB8
				Sampling date / time	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00
					ES2304523-013	ES2304523-014	ES2304523-015	ES2304523-016	ES2304523-017
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø **Sample Description**	----	-	--		**Hyrtlii**	**Glassfish**	**Macrobrachium**	**Tandanus**	**Hardyhead**
ø **Weight of Sample Prepared**	----	0.1	g		**15.0**	**19.0**	**4.3**	**12.5**	**17.0**
EG094: Metals in Biota by ICPMS									
ø **Arsenic**	7440-38-2	0.05	mg/kg		<0.05	**0.17**	**0.33**	<0.05	**0.20**
ø **Barium**	7440-39-3	0.1	mg/kg		<0.1	**1.6**	**19.2**	**0.2**	**5.6**
ø **Boron**	7440-42-8	5	mg/kg		<5	<5	<5	<5	<5
ø **Chromium**	7440-47-3	0.05	mg/kg		**0.60**	**0.09**	**0.42**	<0.05	**0.25**
ø **Copper**	7440-50-8	0.1	mg/kg		**0.4**	**0.5**	**16.7**	**0.3**	**0.5**
ø **Molybdenum**	7439-98-7	0.05	mg/kg		**0.07**	<0.05	**0.06**	<0.05	**0.05**
ø **Selenium**	7782-49-2	0.05	mg/kg		**0.14**	**0.20**	**0.22**	**0.12**	**0.11**
ø **Strontium**	7440-24-6	0.1	mg/kg		**1.0**	**41.6**	**78.4**	**0.5**	**79.6**
ø **Uranium**	7440-61-1	0.01	mg/kg		<0.01	<0.01	<0.01	<0.01	<0.01
ø **Vanadium**	7440-62-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ø **Zinc**	7440-66-6	0.5	mg/kg		**11.5**	**34.9**	**29.8**	**7.0**	**50.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		<1	<1	<1	<1	**64**
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	<1	<1	**4**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		<1	<1	<1	<1	**68**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB9 Hyrtlii AB9	AB9 Glassfish AB9	AB9 Macrobrachium AB9	AB9 Tandanus AB9	AB8 Hardyhead AB8
				Sampling date / time	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00
					ES2304523-013	ES2304523-014	ES2304523-015	ES2304523-016	ES2304523-017
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB9 Hyrtlii AB9	AB9 Glassfish AB9	AB9 Macrobrachium AB9	AB9 Tandanus AB9	AB8 Hardyhead AB8
				Sampling date / time	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00
					ES2304523-013	ES2304523-014	ES2304523-015	ES2304523-016	ES2304523-017
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	<1	<1	<1	**68**
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	1	µg/kg		<1	<1	<1	<1	**68**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**97.2**	**95.8**	**96.5**	**104**	**105**
13C8-PFOA	----	1	%		**102**	**97.8**	**97.2**	**97.6**	**97.4**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	AB8 Hyrtlii AB8	AB8 Glassfish AB8	AB8 Yellowbelly AB8	AB4 Atyidae AB4	AB4 Tandanus AB4
			Sampling date / time	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00	02-Feb-2023 00:00	02-Feb-2023 00:00
Compound	CAS Number	LOR	Unit	ES2304523-018	ES2304523-019	ES2304523-020	ES2304523-021	ES2304523-022
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Hyrtlii	Glassfish	Yellowbelly	Atyidae	Tandanus
ø Weight of Sample Prepared	----	0.1	g	13.0	15.0	154	1.9	112
EG094: Metals in Biota by ICPMS								
ø Arsenic	7440-38-2	0.05	mg/kg	<0.05	0.15	0.06	----	0.16
ø Barium	7440-39-3	0.1	mg/kg	0.3	6.0	1.0	----	<0.1
ø Boron	7440-42-8	5	mg/kg	<5	<5	<5	----	<5
ø Chromium	7440-47-3	0.05	mg/kg	<0.05	0.48	<0.05	----	<0.05
ø Copper	7440-50-8	0.1	mg/kg	0.3	0.6	0.4	----	0.2
ø Molybdenum	7439-98-7	0.05	mg/kg	<0.05	0.09	<0.05	----	<0.05
ø Selenium	7782-49-2	0.05	mg/kg	0.21	0.13	0.52	----	0.12
ø Strontium	7440-24-6	0.1	mg/kg	7.6	82.6	27.0	----	0.5
ø Uranium	7440-61-1	0.01	mg/kg	<0.01	<0.01	<0.01	----	<0.01
ø Vanadium	7440-62-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	<0.5
ø Zinc	7440-66-6	0.5	mg/kg	14.1	40.2	9.8	----	5.2
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	7	82	4	3	3
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	1	7	1	<1	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	8	89	5	3	4
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB8 Hyrtlii AB8	AB8 Glassfish AB8	AB8 Yellowbelly AB8	AB4 Atyidae AB4	AB4 Tandanus AB4
				Sampling date / time	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00	02-Feb-2023 00:00	02-Feb-2023 00:00
					ES2304523-018	ES2304523-019	ES2304523-020	ES2304523-021	ES2304523-022
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB8 Hyrtlii AB8	AB8 Glassfish AB8	AB8 Yellowbelly AB8	AB4 Atyidae AB4	AB4 Tandanus AB4
				Sampling date / time	01-Feb-2023 00:00	01-Feb-2023 00:00	01-Feb-2023 00:00	02-Feb-2023 00:00	02-Feb-2023 00:00
					ES2304523-018	ES2304523-019	ES2304523-020	ES2304523-021	ES2304523-022
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**8**	**89**	**5**	**3**	**5**
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	1	µg/kg		**8**	**89**	**5**	**3**	**5**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**65.2**	**100**	**93.2**	**91.4**	**93.9**
13C8-PFOA	----	1	%		**79.1**	**93.2**	**121**	**111**	**111**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	AB4 Hardyhead AB4	AB4 Sleepy cod AB4	AB5 Glassfish AB5	AB7 Atyidae AB7	AB7 Glassfish AB7
			Sampling date / time	02-Feb-2023 00:00	02-Feb-2023 00:00	02-Feb-2023 00:00	03-Feb-2023 00:00	03-Feb-2023 00:00
Compound	CAS Number	LOR	Unit	ES2304523-023	ES2304523-025	ES2304523-026	ES2304523-027	ES2304523-028
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Hardyhead	Sleepy cod	Glassfish	Atyidae	Glassfish
ø Weight of Sample Prepared	----	0.1	g	2.2	5.1	0.9	1.2	1.4
EG094: Metals in Biota by ICPMS								
ø Arsenic	7440-38-2	0.05	mg/kg	0.51	----	----	----	----
ø Barium	7440-39-3	0.1	mg/kg	12.9	----	----	----	----
ø Boron	7440-42-8	5	mg/kg	<5	----	----	----	----
ø Chromium	7440-47-3	0.05	mg/kg	0.12	----	----	----	----
ø Copper	7440-50-8	0.1	mg/kg	0.7	----	----	----	----
ø Molybdenum	7439-98-7	0.05	mg/kg	<0.05	----	----	----	----
ø Selenium	7782-49-2	0.05	mg/kg	0.18	----	----	----	----
ø Strontium	7440-24-6	0.1	mg/kg	109	----	----	----	----
ø Uranium	7440-61-1	0.01	mg/kg	<0.01	----	----	----	----
ø Vanadium	7440-62-2	0.5	mg/kg	<0.5	----	----	----	----
ø Zinc	7440-66-6	0.5	mg/kg	96.5	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	<1	1	35	28	66
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	5	3	18
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	1	40	31	84
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	AB4 Hardyhead AB4	AB4 Sleepy cod AB4	AB5 Glassfish AB5	AB7 Atyidae AB7	AB7 Glassfish AB7
				Sampling date / time	02-Feb-2023 00:00	02-Feb-2023 00:00	02-Feb-2023 00:00	03-Feb-2023 00:00	03-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		ES2304523-023	ES2304523-025	ES2304523-026	ES2304523-027	ES2304523-028
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB4 Hardyhead AB4	AB4 Sleepy cod AB4	AB5 Glassfish AB5	AB7 Atyidae AB7	AB7 Glassfish AB7
				Sampling date / time	02-Feb-2023 00:00	02-Feb-2023 00:00	02-Feb-2023 00:00	03-Feb-2023 00:00	03-Feb-2023 00:00
					ES2304523-023	ES2304523-025	ES2304523-026	ES2304523-027	ES2304523-028
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	**1**	**40**	**31**	**84**
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	1	µg/kg		<1	**1**	**40**	**31**	**84**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**95.0**	**98.8**	**103**	**100**	**103**
13C8-PFOA	----	1	%		**112**	**118**	**115**	**115**	**112**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	AB7 Hardyhead AB7	AB1 Redclaw AB1	AB1 Tandanus AB1	AB1 Hardyhead AB1	AB1 Glassfish AB1
			Sampling date / time	03-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00
Compound	CAS Number	LOR	Unit	ES2304523-029	ES2304523-030	ES2304523-031	ES2304523-032	ES2304523-033
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Hardyhead	Redclaw	Tandanus	Hardyhead	Glassfish
ø Weight of Sample Prepared	----	0.1	g	0.6	63.0	238	13.0	7.9
EG094: Metals in Biota by ICPMS								
ø Arsenic	7440-38-2	0.05	mg/kg	----	0.50	0.12	0.21	0.20
ø Barium	7440-39-3	0.1	mg/kg	----	47.5	0.2	7.4	6.1
ø Boron	7440-42-8	5	mg/kg	----	<5	<5	<5	<5
ø Chromium	7440-47-3	0.05	mg/kg	----	2.41	<0.05	0.18	0.79
ø Copper	7440-50-8	0.1	mg/kg	----	15.7	0.7	0.6	1.2
ø Molybdenum	7439-98-7	0.05	mg/kg	----	0.33	<0.05	<0.05	0.10
ø Selenium	7782-49-2	0.05	mg/kg	----	0.07	0.26	0.17	0.25
ø Strontium	7440-24-6	0.1	mg/kg	----	134	1.9	93.6	95.6
ø Uranium	7440-61-1	0.01	mg/kg	----	<0.01	<0.01	<0.01	<0.01
ø Vanadium	7440-62-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
ø Zinc	7440-66-6	0.5	mg/kg	----	15.3	6.1	66.7	48.6
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<2	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<2	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<2	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<2	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	30	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	10	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	40	<1	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<2	<1	<1	<1	<1

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	AB7 Hardyhead AB7	AB1 Redclaw AB1	AB1 Tandanus AB1	AB1 Hardyhead AB1	AB1 Glassfish AB1
				Sampling date / time	03-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		ES2304523-029	ES2304523-030	ES2304523-031	ES2304523-032	ES2304523-033
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<2	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<2	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<2	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<2	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<2	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<6	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<6	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<6	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<6	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<6	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<2	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<2	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	AB7 Hardyhead AB7	AB1 Redclaw AB1	AB1 Tandanus AB1	AB1 Hardyhead AB1	AB1 Glassfish AB1
				Sampling date / time	03-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		ES2304523-029	ES2304523-030	ES2304523-031	ES2304523-032	ES2304523-033
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**40**	<1	<1	<1	<1
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	1	µg/kg		**40**	<1	<1	<1	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**93.0**	**100**	**98.2**	**105**	**104**
13C8-PFOA	----	1	%		**119**	**119**	**113**	**117**	**113**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB1 Hyrtlii AB1	AB1 Macrobrachium AB1	AB1 Yellowbelly AB1	AB1 Sleepy cod AB1	AB4 Porocheilus AB4
				Sampling date / time	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	02-Feb-2023 00:00
					ES2304523-034	ES2304523-035	ES2304523-036	ES2304523-037	ES2304523-038
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø **Sample Description**	----	-	--		**Hyrtlii**	**Macrobrachium**	**Yellowbelly**	**Sleepy cod**	**Porocheilus**
ø **Weight of Sample Prepared**	----	0.1	g		**141**	**3.4**	**1150**	**535**	**2.4**
EG094: Metals in Biota by ICPMS									
ø **Arsenic**	7440-38-2	0.05	mg/kg		**0.07**	**0.55**	**0.06**	**0.06**	**----**
ø **Barium**	7440-39-3	0.1	mg/kg		<0.1	**30.4**	<0.1	<0.1	**----**
ø **Boron**	7440-42-8	5	mg/kg		<5	<5	<5	<5	**----**
ø **Chromium**	7440-47-3	0.05	mg/kg		<0.05	**0.15**	<0.05	<0.05	**----**
ø **Copper**	7440-50-8	0.1	mg/kg		**0.3**	**23.8**	**0.3**	**1.1**	**----**
ø **Molybdenum**	7439-98-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	**----**
ø **Selenium**	7782-49-2	0.05	mg/kg		**0.22**	**0.22**	**0.44**	**0.17**	**----**
ø **Strontium**	7440-24-6	0.1	mg/kg		**0.8**	**121**	**0.5**	**0.6**	**----**
ø **Uranium**	7440-61-1	0.01	mg/kg		<0.01	<0.01	<0.01	<0.01	**----**
ø **Vanadium**	7440-62-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	**----**
ø **Zinc**	7440-66-6	0.5	mg/kg		**12.4**	**44.5**	**10.1**	**7.2**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		<1	<1	<1	<1	**14**
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	<1	<1	**2**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		<1	<1	<1	<1	**16**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB1 Hyrtlii AB1	AB1 Macrobrachium AB1	AB1 Yellowbelly AB1	AB1 Sleepy cod AB1	AB4 Porocheilus AB4
				Sampling date / time	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	02-Feb-2023 00:00
					ES2304523-034	ES2304523-035	ES2304523-036	ES2304523-037	ES2304523-038
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB1 Hyrtlii AB1	AB1 Macrobrachium AB1	AB1 Yellowbelly AB1	AB1 Sleepy cod AB1	AB4 Porocheilus AB4
				Sampling date / time	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	04-Feb-2023 00:00	02-Feb-2023 00:00
					ES2304523-034	ES2304523-035	ES2304523-036	ES2304523-037	ES2304523-038
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	<1	<1	<1	**16**
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	1	µg/kg		<1	<1	<1	<1	**16**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**99.5**	**106**	**93.0**	**100**	**94.0**
13C8-PFOA	----	1	%		**100**	**98.0**	**100**	**102**	**106**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	AB5 Porocheilus AB5	AB1 Porocheilus AB1	AB3 Barramundi Duplicated (1)	AB3 Hardyhead Duplicated (7)	AB9 Hyrtlii Duplicated (13)
			Sampling date / time	02-Feb-2023 00:00	02-Feb-2023 00:00	30-Jan-2023 00:00	31-Jan-2023 00:00	01-Feb-2023 00:00
Compound	CAS Number	LOR	Unit	ES2304523-039	ES2304523-040	ES2304523-047	ES2304523-048	ES2304523-049
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Porocheilus	Porocheilus	Barramundi	Hardyhead	Hyrtlii
ø Weight of Sample Prepared	----	0.1	g	39.0	7.7	10600	27.0	15.0
EG094: Metals in Biota by ICPMS								
ø Arsenic	7440-38-2	0.05	mg/kg	0.06	0.05	0.06	0.24	<0.05
ø Barium	7440-39-3	0.1	mg/kg	1.2	0.7	<0.1	2.8	0.2
ø Boron	7440-42-8	5	mg/kg	<5	<5	<5	<5	<5
ø Chromium	7440-47-3	0.05	mg/kg	1.76	2.44	<0.05	1.44	0.55
ø Copper	7440-50-8	0.1	mg/kg	1.0	1.2	0.3	0.6	0.4
ø Molybdenum	7439-98-7	0.05	mg/kg	0.24	0.35	<0.05	0.20	0.07
ø Selenium	7782-49-2	0.05	mg/kg	0.10	0.16	0.18	0.21	0.13
ø Strontium	7440-24-6	0.1	mg/kg	55.5	54.3	0.6	61.3	5.9
ø Uranium	7440-61-1	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
ø Vanadium	7440-62-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ø Zinc	7440-66-6	0.5	mg/kg	49.2	39.5	5.1	54.3	15.6
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	42	2	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	2	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	44	2	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB5 Porocheilus AB5	AB1 Porocheilus AB1	AB3 Barramundi Duplicated (1)	AB3 Hardyhead Duplicated (7)	AB9 Hyrtlii Duplicated (13)
				Sampling date / time	02-Feb-2023 00:00	02-Feb-2023 00:00	30-Jan-2023 00:00	31-Jan-2023 00:00	01-Feb-2023 00:00
					ES2304523-039	ES2304523-040	ES2304523-047	ES2304523-048	ES2304523-049
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA** (Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB5 Porocheilus AB5	AB1 Porocheilus AB1	AB3 Barramundi Duplicated (1)	AB3 Hardyhead Duplicated (7)	AB9 Hyrtlii Duplicated (13)
				Sampling date / time	02-Feb-2023 00:00	02-Feb-2023 00:00	30-Jan-2023 00:00	31-Jan-2023 00:00	01-Feb-2023 00:00
					ES2304523-039	ES2304523-040	ES2304523-047	ES2304523-048	ES2304523-049
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**44**	**2**	<1	<1	<1
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	1	µg/kg		**44**	**2**	<1	<1	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**96.5**	**92.0**	**93.0**	**94.5**	**105**
13C8-PFOA	----	1	%		**106**	**102**	**102**	**96.5**	**104**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB1 Yellowbelly Duplicated (36)	AB4 Glassfish AB4	AB2 Barramundi Duplicated (2)	AB2 Redclaw ALS Duplicated (6)	AB8 Yellowbelly Duplicated (20)
				Sampling date / time	04-Feb-2023 00:00	02-Feb-2023 00:00	30-Jan-2023 00:00	30-Jan-2023 00:00	30-Jan-2023 00:00
					ES2304523-050	ES2304523-051	ES2304523-052	ES2304523-053	ES2304523-054
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø **Sample Description**	----	-	--		**Yellowbelly**	**Glassfish**	**Barramundi**	**Redclaw**	**Yellowbelly**
ø **Weight of Sample Prepared**	----	0.1	g		**1150**	**3.0**	**11200**	**10.0**	**154**
EG094: Metals in Biota by ICPMS									
ø **Arsenic**	7440-38-2	0.05	mg/kg		**0.05**	**----**	**0.07**	**0.27**	**0.06**
ø **Barium**	7440-39-3	0.1	mg/kg		<0.1	**----**	<0.1	**2.1**	**0.2**
ø **Boron**	7440-42-8	5	mg/kg		<5	**----**	<5	<5	<5
ø **Chromium**	7440-47-3	0.05	mg/kg		<0.05	**----**	<0.05	**0.14**	<0.05
ø **Copper**	7440-50-8	0.1	mg/kg		**0.3**	**----**	**0.3**	**7.1**	**0.4**
ø **Molybdenum**	7439-98-7	0.05	mg/kg		<0.05	**----**	<0.05	<0.05	<0.05
ø **Selenium**	7782-49-2	0.05	mg/kg		**0.40**	**----**	**0.18**	**0.08**	**0.49**
ø **Strontium**	7440-24-6	0.1	mg/kg		**0.4**	**----**	**0.8**	**24.5**	**6.2**
ø **Uranium**	7440-61-1	0.01	mg/kg		<0.01	**----**	<0.01	<0.01	<0.01
ø **Vanadium**	7440-62-2	0.5	mg/kg		<0.5	**----**	<0.5	<0.5	<0.5
ø **Zinc**	7440-66-6	0.5	mg/kg		**9.3**	**----**	**4.9**	**16.9**	**7.5**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		<1	**7**	<1	<1	**4**
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	**3**	<1	<1	**2**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		<1	**10**	<1	<1	**6**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	AB1 Yellowbelly Duplicated (36)	AB4 Glassfish AB4	AB2 Barramundi Duplicated (2)	AB2 Redclaw ALS Duplicated (6)	AB8 Yellowbelly Duplicated (20)
				Sampling date / time	04-Feb-2023 00:00	02-Feb-2023 00:00	30-Jan-2023 00:00	30-Jan-2023 00:00	30-Jan-2023 00:00
					ES2304523-050	ES2304523-051	ES2304523-052	ES2304523-053	ES2304523-054
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	AB1 Yellowbelly Duplicated (36)	AB4 Glassfish AB4	AB2 Barramundi Duplicated (2)	AB2 Redclaw ALS Duplicated (6)	AB8 Yellowbelly Duplicated (20)
				Sampling date / time	04-Feb-2023 00:00	02-Feb-2023 00:00	30-Jan-2023 00:00	30-Jan-2023 00:00	30-Jan-2023 00:00
Compound	CAS Number	LOR	Unit		ES2304523-050	ES2304523-051	ES2304523-052	ES2304523-053	ES2304523-054
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	**10**	<1	<1	**6**
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	1	µg/kg		<1	**10**	<1	<1	**6**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**104**	**102**	**108**	**98.0**	**104**
13C8-PFOA	----	1	%		**102**	**100**	**102**	**99.0**	**103**

Surrogate Control Limits

Sub-Matrix: **BIOTA**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	50	130
13C8-PFOA	----	50	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2304715**	Page	: 1 of 9
Client	: **HYDROBIOLOGY PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JOSH HATTON	Contact	: Customer Services ES
Address	: 40 TERRIGAL STREET FIG TREE POCKET 4069	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: B22096	Date Samples Received	: 14-Feb-2023 11:00
Order number	: ----	Date Analysis Commenced	: 14-Feb-2023
C-O-C number	: ----	Issue Date	: 17-Feb-2023 18:11
Sampler	: JOSH HATTON		
Site	: ----		
Quote number	: SY/415/22		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	R1	R2	R3	R4	R5
				Sampling date / time	30-Jan-2023 00:00	31-Jan-2023 00:00	01-Feb-2023 00:00	02-Feb-2023 00:00	03-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		ES2304715-001	ES2304715-002	ES2304715-003	ES2304715-004	ES2304715-005
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Barium	7440-39-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Molybdenum	7439-98-7	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Strontium	7440-24-6	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	7440-61-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Boron	7440-42-8	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	R1	R2	R3	R4	R5
				Sampling date / time	30-Jan-2023 00:00	31-Jan-2023 00:00	01-Feb-2023 00:00	02-Feb-2023 00:00	03-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		ES2304715-001	ES2304715-002	ES2304715-003	ES2304715-004	ES2304715-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	R1	R2	R3	R4	R5
				Sampling date / time	30-Jan-2023 00:00	31-Jan-2023 00:00	01-Feb-2023 00:00	02-Feb-2023 00:00	03-Feb-2023 00:00
Compound	CAS Number	LOR	Unit		ES2304715-001	ES2304715-002	ES2304715-003	ES2304715-004	ES2304715-005
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.6**	**102**	**98.8**	**96.1**	**100**
13C8-PFOA	----	0.02	%		**97.0**	**102**	**105**	**102**	**100**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	A1	----	----	----	----
				Sampling date / time	03-Feb-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2304715-006	--------	--------	--------	--------
					Result	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Barium	7440-39-3	0.001	mg/L		<0.001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Strontium	7440-24-6	0.001	mg/L		<0.001	----	----	----	----
Uranium	7440-61-1	0.001	mg/L		<0.001	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L		<0.01	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Boron	7440-42-8	0.05	mg/L		<0.05	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	A1	----	----	----	----
				Sampling date / time	03-Feb-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2304715-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	A1	----	----	----	----
				Sampling date / time	03-Feb-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2304715-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231P: PFAS Sums - Continued									
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.8**	----	----	----	----
13C8-PFOA	----	0.02	%		**103**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

REPORT OF ANALYSIS

Report No. RN1385971

Client	: HYDROBIOLOGY	**Job No.**	: HYDR09/230224
	27/43 LANG PARADE	**Quote No.**	: QT-02232
	MILTON QLD 4064	**Order No.**	: B22096
		Date Received	: 24-FEB-2023
Attention	: JOSH HATTON	**Sampled By**	: CLIENT
Project Name	:		
Your Client Services Manager	: Danny Slee	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N23/003440	.	BIOTA ES2304523-006AB 31-JAN-2023
N23/003442	.	BIOTA ES2304523-007 31-JAN-2023
N23/003443	.	BIOTA ES2304523-008 31-JAN-2023
N23/003444	.	BIOTA ES2304523-009 31-JAN-2023

Lab Reg No.		N23/003440	N23/003442	N23/003443	N23/003444	
Date Sampled		31-JAN-2023	31-JAN-2023	31-JAN-2023	31-JAN-2023	
Sample Reference		.	.	.	.	
	Units					**Method**
Total Recoverable Trace Elements by ICP						
Lithium	mg/kg	<0.2	<0.2	<0.2	<0.2	NT2_46
Thorium Th	mg/kg	<0.01	<0.01	<0.01	<0.01	NT2_46
Dates						
Date extracted		14-MAR-2023	14-MAR-2023	14-MAR-2023	14-MAR-2023	
Date analysed		15-MAR-2023	15-MAR-2023	15-MAR-2023	15-MAR-2023	

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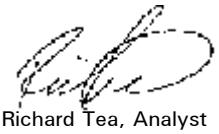
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Project Name	:		
Your Client Services Manager	: Danny Slee	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N23/003445	.	BIOTA ES2304523-011 31-JAN-2023
N23/003446	.	BIOTA ES2304523-013 01-FEB-2023
N23/003447	.	BIOTA ES2304523-014 01-FEB-2023
N23/003448	.	BIOTA ES2304523-015 01-FEB-2023

Lab Reg No.	Units	N23/003445	N23/003446	N23/003447	N23/003448	Method
Date Sampled		**31-JAN-2023**	**01-FEB-2023**	**01-FEB-2023**	**01-FEB-2023**	
Sample Reference		.	.	.	.	
Total Recoverable Trace Elements by ICP						
Lithium	mg/kg	<0.2	<0.2	<0.2	<0.2	NT2_46
Thorium Th	mg/kg	<0.01	<0.01	<0.01	0.022	NT2_46
Dates						
Date extracted		14-MAR-2023	14-MAR-2023	14-MAR-2023	14-MAR-2023	
Date analysed		15-MAR-2023	15-MAR-2023	15-MAR-2023	15-MAR-2023	



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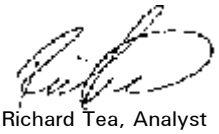
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Project Name	:		
Your Client Services Manager	: Danny Slee	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N23/003449	.	BIOTA ES2304523-016 01-FEB-2023
N23/003450	.	BIOTA ES2304523-017 01-FEB-2023
N23/003451	.	BIOTA ES2304523-018 01-FEB-2023
N23/003452	.	BIOTA ES2304523-019 01-FEB-2023

Lab Reg No.	Units	N23/003449	N23/003450	N23/003451	N23/003452	Method
Date Sampled		**01-FEB-2023**	**01-FEB-2023**	**01-FEB-2023**	**01-FEB-2023**	
Sample Reference		.	.	.	.	
Total Recoverable Trace Elements by ICP						
Lithium	mg/kg	<0.2	<0.2	<0.2	<0.2	NT2_46
Thorium Th	mg/kg	<0.01	<0.01	<0.01	<0.01	NT2_46
Dates						
Date extracted		14-MAR-2023	14-MAR-2023	14-MAR-2023	14-MAR-2023	
Date analysed		15-MAR-2023	15-MAR-2023	15-MAR-2023	15-MAR-2023	



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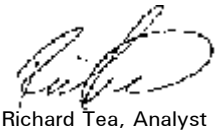
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	27/43 LANG PARADE	**Quote No.**	: QT-02232
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		Date Received	: 24-FEB-2023
Attention	: JOSH HATTON	**Sampled By**	: CLIENT
Project Name	:		
Your Client Services Manager	: Danny Slee	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N23/003456	.	BIOTA ES2304523-025 02-FEB-2023
N23/003457	.	BIOTA ES2304523-030 04-FEB-2023
N23/003459	.	BIOTA ES2304523-032 04-FEB-2023
N23/003460	.	BIOTA ES2304523-033 04-FEB-2023

Lab Reg No.	Units	N23/003456	N23/003457	N23/003459	N23/003460	Method
Date Sampled		02-FEB-2023	04-FEB-2023	04-FEB-2023	04-FEB-2023	
Sample Reference		.	.	.	.	
Total Recoverable Trace Elements by ICP						
Lithium	mg/kg	<0.2	<0.2	<0.2	<0.2	NT2_46
Thorium Th	mg/kg	<0.01	<0.01	<0.01	<0.01	NT2_46
Dates						
Date extracted		14-MAR-2023	14-MAR-2023	14-MAR-2023	14-MAR-2023	
Date analysed		15-MAR-2023	15-MAR-2023	15-MAR-2023	15-MAR-2023	



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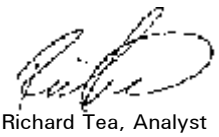
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Client	: HYDROBIOLOGY	**Job No.**	: HYDR09/230224
	27/43 LANG PARADE	**Quote No.**	: QT-02232
	MILTON QLD 4064	**Order No.**	: B22096
		Date Received	: 24-FEB-2023
Attention	: JOSH HATTON	**Sampled By**	: CLIENT
Project Name	:		
Your Client Services Manager	: Danny Slee	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N23/003464	.	BIOTA ES2304523-039 02-FEB-2023
N23/003465	.	BIOTA ES2304523-040 02-FEB-2023

Lab Reg No.		N23/003464	N23/003465			
Date Sampled		02-FEB-2023	02-FEB-2023			
Sample Reference	Units	.	.			Method
Total Recoverable Trace Elements by ICP						
Lithium	mg/kg	<0.2	<0.2			NT2_46
Thorium Th	mg/kg	<0.01	<0.01			NT2_46
Dates						
Date extracted		14-MAR-2023	14-MAR-2023			
Date analysed		15-MAR-2023	15-MAR-2023			



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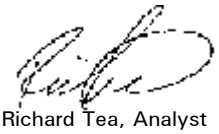
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	27/43 LANG PARADE	**Quote No.**	: QT-02232
	MILTON QLD 4064	**Order No.**	: B22096
		Date Received	: 24-FEB-2023
Attention	: JOSH HATTON	**Sampled By**	: CLIENT
Project Name	:		
Your Client Services Manager	: Danny Slee	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N23/003436	.	BIOTA ES2304523-001 30-JAN-2023
N23/003437	.	BIOTA ES2304523-002 30-JAN-2023
N23/003438	.	BIOTA ES2304523-003 30-JAN-2023
N23/003439	.	BIOTA ES2304523-004 31-JAN-2023

Lab Reg No.			N23/003436	N23/003437	N23/003438	N23/003439	
Date Sampled			30-JAN-2023	30-JAN-2023	30-JAN-2023	31-JAN-2023	
Sample Reference		Units	.	.	.	.	Method
Total Recoverable Trace Elements by ICP							
Lithium		mg/kg	<0.2	<0.2	<0.2	<0.2	NT2_46
Thorium Th		mg/kg	<0.01	0.018	0.022	<0.01	NT2_46
Dates							
Date extracted			14-MAR-2023	14-MAR-2023	14-MAR-2023	14-MAR-2023	
Date analysed			15-MAR-2023	15-MAR-2023	15-MAR-2023	15-MAR-2023	



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Lab Reg No.			N23/003436	N23/003437	N23/003438	N23/003439	
Date Sampled			30-JAN-2023	30-JAN-2023	30-JAN-2023	31-JAN-2023	
Sample Reference		Units	.	.	.	.	Method
Miscellaneous							
Fluoride - Total		mg/kg	<0.2	<0.2	<0.2	6.3	VL417

N23/003436
Note: Not NATA Accredited for Fluoride by Method VL417.

N23/003437
Note: Not NATA Accredited for Fluoride by Method VL417.

N23/003438

Note: Not NATA Accredited for Fluoride by Method VL417.

N23/003439
Note: Not NATA Accredited for Fluoride by Method VL417.

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17-MAR-2023

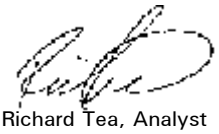
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	27/43 LANG PARADE	**Quote No.**	: QT-02232
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		Date Received	: 24-FEB-2023
Attention	: JOSH HATTON	**Sampled By**	: CLIENT
Project Name	:		
Your Client Services Manager	: Danny Slee	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N23/003441	.	BIOTA ES2304523-006AC 31-JAN-2023
N23/003453	.	BIOTA ES2304523-020AD 01-FEB-2023
N23/003454	.	BIOTA ES2304523-020AA 01-FEB-2023
N23/003455	.	BIOTA ES2304523-022 02-FEB-2023

Lab Reg No.		Units	N23/003441	N23/003453	N23/003454	N23/003455	Method
Date Sampled			**31-JAN-2023**	**01-FEB-2023**	**01-FEB-2023**	**02-FEB-2023**	
Sample Reference			.	.	.	.	
Total Recoverable Trace Elements by ICP							
Lithium		mg/kg	<0.2	<0.2	<0.2	<0.2	NT2_46
Thorium Th		mg/kg	<0.01	<0.01	<0.01	<0.01	NT2_46
Dates							
Date extracted			14-MAR-2023	14-MAR-2023	14-MAR-2023	14-MAR-2023	
Date analysed			15-MAR-2023	15-MAR-2023	15-MAR-2023	15-MAR-2023	



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Lab Reg No.		Units	N23/003441	N23/003453	N23/003454	N23/003455	Method
Date Sampled			**31-JAN-2023**	**01-FEB-2023**	**01-FEB-2023**	**02-FEB-2023**	
Sample Reference			.	.	.	.	
Miscellaneous							
Fluoride - Total		mg/kg	18	0.25	3.5	<0.2	VL417

N23/003441
Note: Not NATA Accredited for Fluoride by Method VL417.

N23/003453

Note: Not NATA Accredited for Fluoride by Method VL417.

N23/003454
Note: Not NATA Accredited for Fluoride by Method VL417.

N23/003455
Note: Not NATA Accredited for Fluoride by Method VL417.



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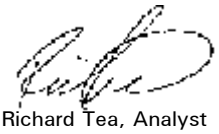
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Project Name	:		
Your Client Services Manager	: Danny Slee	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N23/003458	.	BIOTA ES2304523-031 04-FEB-2023
N23/003461	.	BIOTA ES2304523-034 04-FEB-2023
N23/003462	.	BIOTA ES2304523-036 04-FEB-2023
N23/003463	.	BIOTA ES2304523-037 04-FEB-2023

Lab Reg No.		Units	N23/003458	N23/003461	N23/003462	N23/003463	Method
Date Sampled			04-FEB-2023	04-FEB-2023	04-FEB-2023	04-FEB-2023	
Sample Reference			.	.	.	.	
Total Recoverable Trace Elements by ICP							
Lithium		mg/kg	<0.2	<0.2	<0.2	<0.2	NT2_46
Thorium Th		mg/kg	<0.01	<0.01	<0.01	<0.01	NT2_46
Dates							
Date extracted			14-MAR-2023	14-MAR-2023	14-MAR-2023	14-MAR-2023	
Date analysed			15-MAR-2023	15-MAR-2023	15-MAR-2023	15-MAR-2023	



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Lab Reg No.		Units	N23/003458	N23/003461	N23/003462	N23/003463	Method
Date Sampled			04-FEB-2023	04-FEB-2023	04-FEB-2023	04-FEB-2023	
Sample Reference			.	.	.	.	
Miscellaneous							
Fluoride - Total		mg/kg	<0.2	<0.2	<0.2	<0.2	VL417

N23/003458
Note: Not NATA Accredited for Fluoride by Method VL417.

N23/003461
Note: Not NATA Accredited for Fluoride by Method VL417.

N23/003462
Note: Not NATA Accredited for Fluoride by Method VL417.

N23/003463
Note: Not NATA Accredited for Fluoride by Method VL417.

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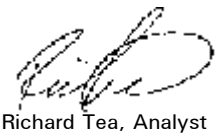
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	MILTON QLD 4064	**Order No.**	: B22096
		Date Received	: 24-FEB-2023
Attention	: JOSH HATTON	**Sampled By**	: CLIENT
Project Name	:		
Your Client Services Manager	: Danny Slee	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N23/003466	.	BIOTA ES2304523-048AA 31-JAN-2023
N23/003475	.	BIOTA ES2304523-050AC 04-FEB-2023

Lab Reg No.			N23/003466	N23/003475			
Date Sampled			31-JAN-2023	04-FEB-2023			
Sample Reference		Units	.	.			Method
Total Recoverable Trace Elements by ICP							
Lithium		mg/kg	<0.2	<0.2			NT2_46
Thorium Th		mg/kg	<0.01	0.011			NT2_46
Dates							
Date extracted			14-MAR-2023	14-MAR-2023			
Date analysed			15-MAR-2023	15-MAR-2023			



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Lab Reg No.			N23/003466	N23/003475			
Date Sampled			31-JAN-2023	04-FEB-2023			
Sample Reference		Units	.	.			Method
Miscellaneous							
Fluoride - Total		mg/kg	3.0	<0.2			VL417

N23/003466

Note: Not NATA Accredited for Fluoride by Method VL417.

N23/003475

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Note: Not NATA Accredited for Fluoride by Method VL417.



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APPENDIX N GEOPHYSICAL RESISTIVITY SURVEY REPORT (FENDER GEOPHYSICS, 2023)

Fender GEOPHYSICS

Processing and Interpretation Report



Callide Power Station
Ash Dam Survey

Fender Geophysics
Unit 8,2-6 Waltham St,
Artarmon NSW 2064

www.fendergeophysics.com.au

02 9460 6580

Report prepared by
James Daniell
November 2022

Project No. 22023

Revision Table				
Rev #	**Description**	**Issue Date**	**Reviewed**	**Approved**
0	Issued for review	16/09/2022	DWH	
1	Comments incorporated and borehole recommendations added	14/11/2022	DWH	

Fender GEOPHYSICS

TABLE OF CONTENTS

1.0 INTRODUCTION 4
2.0 WORKPLACE HEALTH AND SAFETY 7
2.1 Personnel And Equipment 8
3.0 SURVEY PROCEDURE AND SPECIFICATIONS 9
3.1 Survey Area 9
3.2 Resistivity Data Acquisition 13
3.3 Production summary and initial results 18
3.4 Data processing 20
4.0 DATA ANALYSIS 21
4.1 Identification of drill sites 21
4.2 Western margin of the property 23
4.3 Southern Margin of the Ash Dam 29
4.4 Southern Margin of the Property 36
4.5 Western stormwater diversion channel 44
4.6 South-eastern groundwater profiles 49
4.7 Borehole summary. 52
5.0 PROJECT SUMMARY 53
6.0 DELIVERABLES 54

FIGURES

Figure 1. Location of CS Energy power station and ash dam near Biloela, QLD 5
Figure 2. Proposed survey lines for the Callide Dam survey.. 6
Figure 3. Example of 'tall grass' with adjacent road., ... 8
Figure 4. Western Seepage Pond adjacent to the ash dam. 10
Figure 5. Geology of the Callide Ash Dam B site. 11
Figure 6. Bedrock elevations from dam perimeter 12
Figure 7. Generalised resistivity of rocks, soils, and aquifers. 14
Figure 8. Typical survey layout showing ZZgeo unit and tablet for data acquisition.. 16
Figure 9. Data acquisition on roadside. 24
Figure 11. Borehole geology and groundwater indicators from the western margin of the Callide Dam. 25
Figure 12. Resistivity data and interpretation for Line 6a. 26
Figure 13. Resistivity and interpretation for Line 6b. 27
Figure 14. Resistivity and interpretation for Line 7. 28
Figure 15. Geophysical survey lines and boreholes on the southern margin of Ash Dam B. 31
Figure 16. Borehole geology and groundwater indicators from the southern margin of the Callide Dam. 32
Figure 17. Resistivity and interpretation for Line 14. 33
Figure 18. Resistivity and interpretation for Line 5 34
Figure 19. Resistivity and interpretation for Line 4 (partially overlaps with line 5). 35
Figure 18. Geophysical survey lines and boreholes on the southern margin of the Callide Power Station. 37
Figure 19. Borehole geology and groundwater indicators from the southern margin of the Callide Dam 38
Figure 20. Resistivity and interpretation for Line 12 40
Figure 21. Resistivity and interpretation for Line 11. 41
Figure 22. Resistivity and interpretation for Line 10 42
Figure 23. Resistivity and interpretation for Line 9. 43
Figure 24. Geophysical survey lines and boreholes adjacent to the western stormwater diversion. 45
Figure 25. Borehole geology and groundwater indicators from the western stormwater diversion 46
Figure 22. Resistivity and interpretation for Line 8 47
Figure 27. Resistivity and interpretation for Line 13 48
Figure 28. Geophysical survey lines and boreholes adjacent to the south-eastern groundwater bores. 49
Figure 29. Borehole geology and groundwater indicators from the south-eastern groundwater bores 50

Figure 30. Resistivity and interpretation for Line 1. 51
Figure 31. Resistivity and interpretation for Lines 2 and 3 (combined) 51

TABLES

Table 1. P22023 survey Personnel 8
Table 2. P22023 survey equipment 9
Table 3. Acquisition Parameters 16
Table 4. Survey production summary. 19
Table 5. Survey domains and lines with adjacent boreholes 21
Table 6. Proposed locations of boreholes (GDA2020 - MGA56) 52

Disclaimer:

Fender Geophysics guarantees to perform a professional survey using high performance Electrical Resistivity Imaging (ERI) equipment in accordance with best industry practice and guidelines.

However due to the inherent limitations of the electrical resistivity method and the interpretive nature of the results we cannot guarantee 100% detection and accurate representation of subsurface features.

For these reasons, Fender Geophysics does not accept any responsibility or liability for losses or damages of any kind, resulting from undetected, misinterpreted or misrepresented features.

For information about the capabilities and limitations of geophysical survey equipment and case studies, please refer to our website (https://fendergeophysics.com.au).

1.0 INTRODUCTION

This report describes the project brief, logistics, and results of a dipole-dipole electrical resistivity imaging (ERI) survey undertaken for CS Energy between 08/08/2022 and 20/08/2022. CS Energy's Callide Power Station is a coal powered electricity generator located approximately 10km northeast of Biloela and 90km southwest of Gladstone in central QLD (Figure 1). The focus of this project was to identify sources of groundwater and dam seepage at the Callide Power Station Ash Dam B at Biloela, Queensland. Identification of potential drilling locations is provided based on the results of the geophysical survey. Accurate mapping of dam seepage locations and a future drilling program will be used to assist with site remediation. Site remediation will consist of managing contaminants within the dam seepage area and assessing its relationship to local sources of groundwater.

The client was especially interested in groundwater in fractured rock aquifers. The current deepest bores are in the order of 40-50m deep and the client required 100% coverage at these depths. The proposed survey consisted of 41 ERI profiles for the purpose of identifying locations of dam seepage and groundwater sources (Figure 2). The locations of the profiles were:

1. Along the southern margin of the dam (approximately 1.4km)
2. Along the southern margin the property adjacent to Biloela Callide Road including southern seep near MW9 (approximately 2.2km)
3. Along the western margin of the dam (2.5km)
4. In the vicinity of the Western Stormwater Diversion Channel (approximately 0.6km)

Two resistivity profiles were planned specifically to investigate potential groundwater presence in fractured rock strata and identify drilling targets:

1. A profile connecting bores MW32 and MW33 (approximately 0.3km)
2. A profile connecting bores MW31 and MW43 (approximately 0.6km)

The resistivity response of the subsurface is complex and is a result of rock mineralogy, weathering/fracturing, presence of water and salts, and the composition of the soil and alluvium (i.e. clays are known to be good conductors whereas quartz is strongly resistive). Where possible the resistivity data has been ground truthed from borehole data on the Callide Power Station site. Nine locations for possible bores to aid site remediation have been identified.

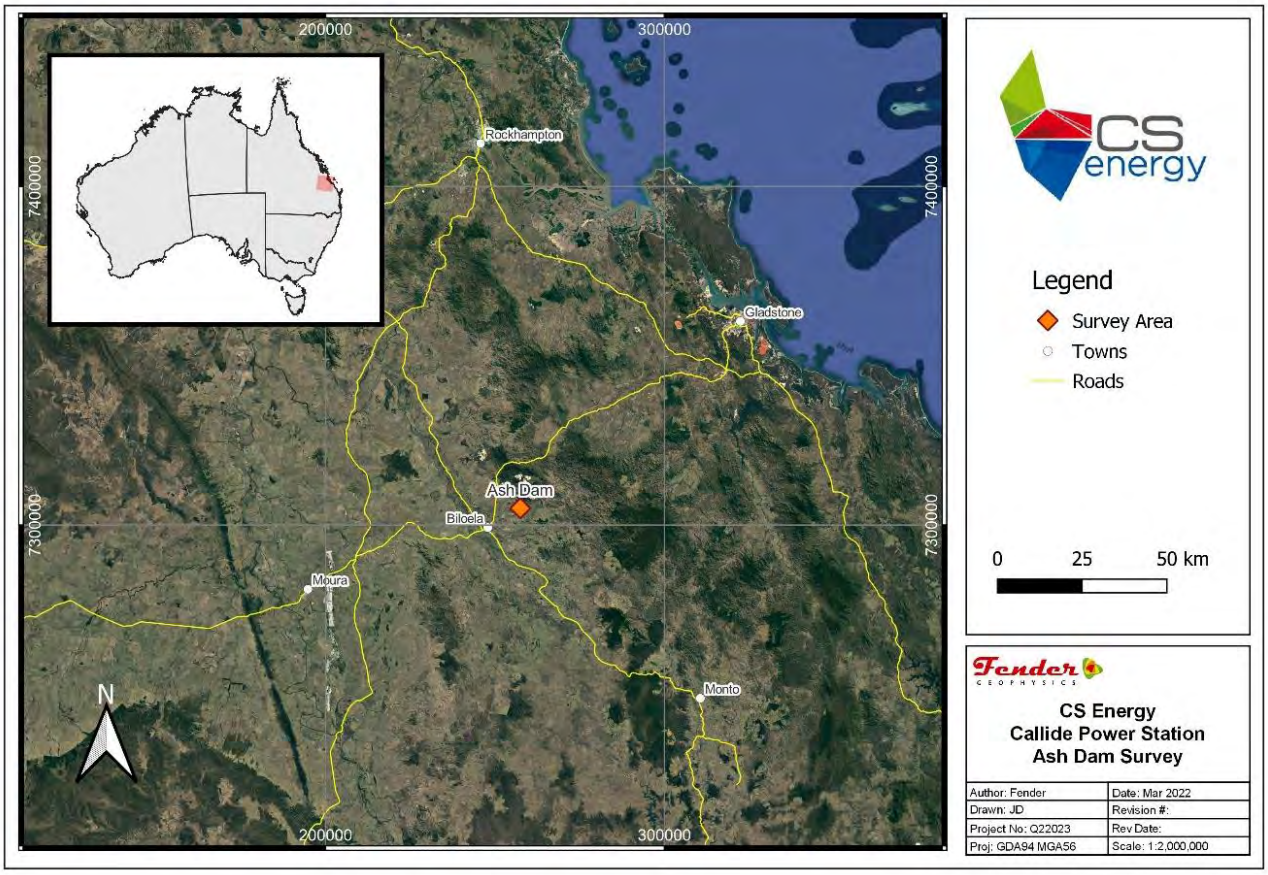


Figure 1. Location of CS Energy power station and ash dam near Biloela, QLD

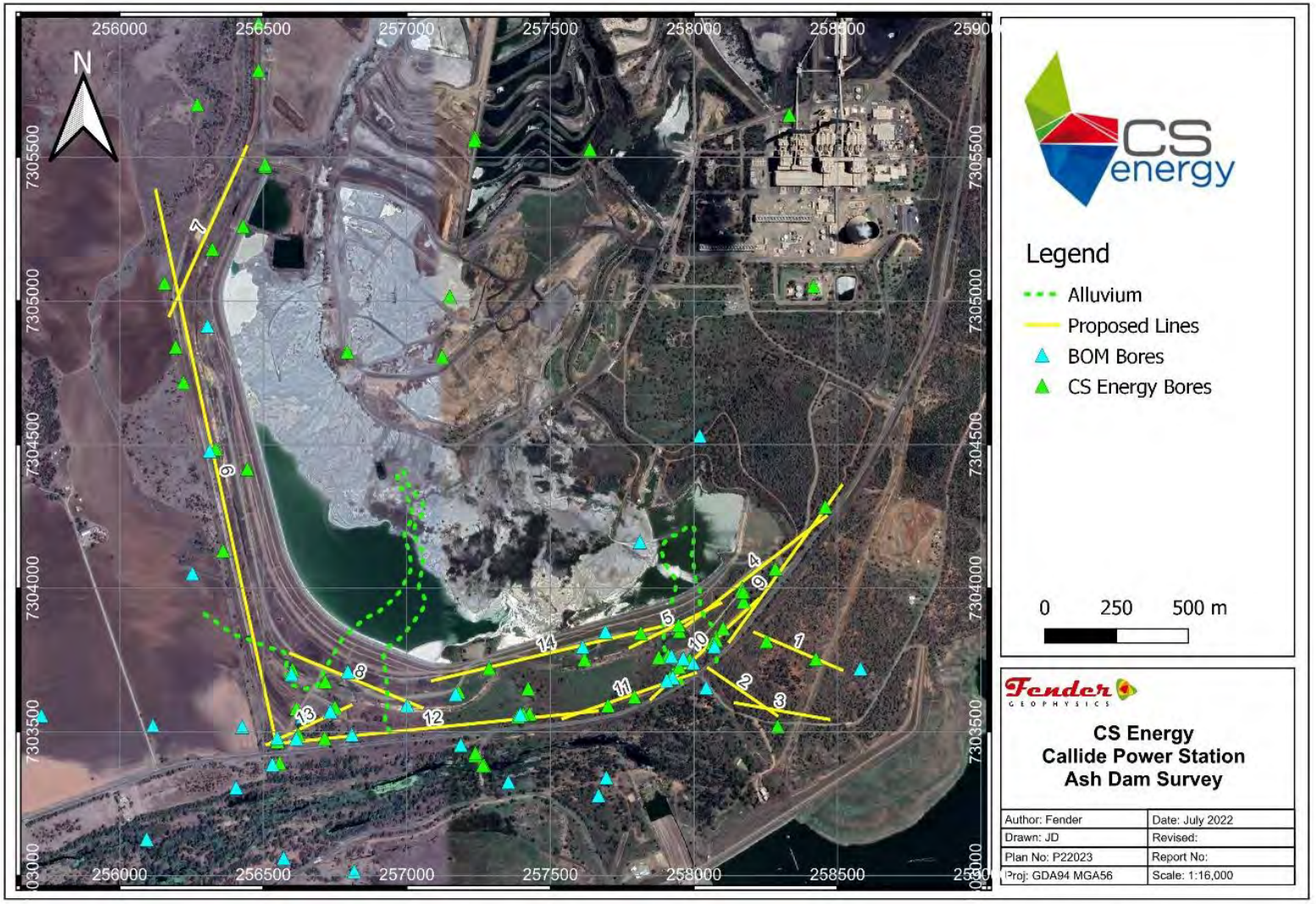


Figure 2. Proposed survey lines for the Callide Dam survey. Existing Bureau of Meteorology (BOM) and CS Energy bores are also shown.

2.0 WORKPLACE HEALTH AND SAFETY

Fender carried out a generalised risk assessment for the project prior to mobilisation which was updated following a review at site. Fender staff also attended a CS Energy safety induction prior to starting work. Safety meetings were held each day to review and discuss any issues observed or expected, and a brief safety discussion was held each morning.

Fender Geophysics staff undertook daily vehicle pre-start safety checks and weekly staff safety meeting. Results from these meetings were submitted to Fender management using the Assignar reporting app.

There were no unique hazards associated with the survey area. Snake bites were considered one of the most likely hazards to be encountered. Long grass was avoided where possible to minimise this risk and survey profiles were located on well-established tracks where possible (Figure 3). Tall grass was cleared by CS Energy staff where possible for ease of access and safety.

Slips, trip, and falls were also considered a serious hazard. Moving most survey lines on to well established tracks also reduced this risk.

Wet track and possible bogging of vehicles was considered a noteworthy risk due to significant rain on the site over the previous week. Established roads posed minimal risk, however, fire trails around the perimeter of the ash dam were clay-rich and ‘soft’. These fire trails were targeted for surveying and were safe to access during the survey despite recent rain.

Although few other vehicles were encountered during the survey, bollards were provided to limit access by vehicles when data was being acquired.

No safety incidents of any kind occurred during the survey.



Figure 3. Example of 'tall grass' with adjacent road. Roadsides were preferentially surveyed where possible. The Ash Dam B is visible to the right of the image looking west towards the Western Seepage Pond,

2.1 Personnel And Equipment

The following personnel were involved with the project:

Client (CS Energy)	Sally Bulten (Environment and Stakeholder Business Partner)
Director/Geophysicist	Andrew Sloot
Project/Survey Manager	James Daniell
Geophysicist	Sam Rubino
Technician	Iain Richardson

Table 1. P22023 Survey Personnel

The following equipment was supplied by Fender for this project:

Item	Model
Resistivity	ZZ Universal 64 channel system
Cables	2x32 channel cables with 5m takeouts
GPS	Handheld Garmin supported by mobile GPS
Data Processing Laptop	Dell Inspiron 15
Mine Spec 4wd	Hilux
Customary survey support equipment including toolbox, first aid kits etc.	

Table 2. P22023 survey equipment

3.0 SURVEY PROCEDURE AND SPECIFICATIONS

3.1 Survey Area

The Callide Power Station Ash Dam B extends approximately 2km north/south, 1.5km east/west, and up to 20-25m above the surrounding land survey (Figure 3). The site was largely grass covered with significant tree and vegetation cover in small, discrete patches. The grass was generally 'long'. The long grass was considered a likely habitat for snakes and obscured numerous drains, pits, and trenches. For safety reasons the long grass was largely avoided during the survey. There were numerous small bodies of water on the site (Figure 4).

Overall site access was excellent. Most of the proposed survey lines were accessed by established roads or fire trails.

The Callide power Station Ash Dam B site is largely underlain by the Lochenbar Formation which is predominantly comprised of Andesitic rocks (Figure 5). The Lochenbar Formation is overlain by Tertiary sediments in the southwest portion of the site and grades into Quaternary alluvium floodplain clays, silts, sands, and gravels associated with Callide Creek. Bedrock elevations derived from geology maps provided from CS Energy show the presence of two 'lows' the correlate with mapped alluvial the south-west and south of the dam (Figure 6).

The Lochenbar Formation is highly fractured beneath the site, with a potential fault running north-south in line with the Callide Dam spillway. Dioritic dykes, likely associated with the faulting have been found running co-linear with the suspected fault.

The principal aquifers identified in the study area comprise:

1. Tertiary and Quaternary alluvial sediments
2. Weathered/fractured bedrock of the Lochenbar Formation



Figure 4 Western Seepage Pond adjacent to the ash dam.

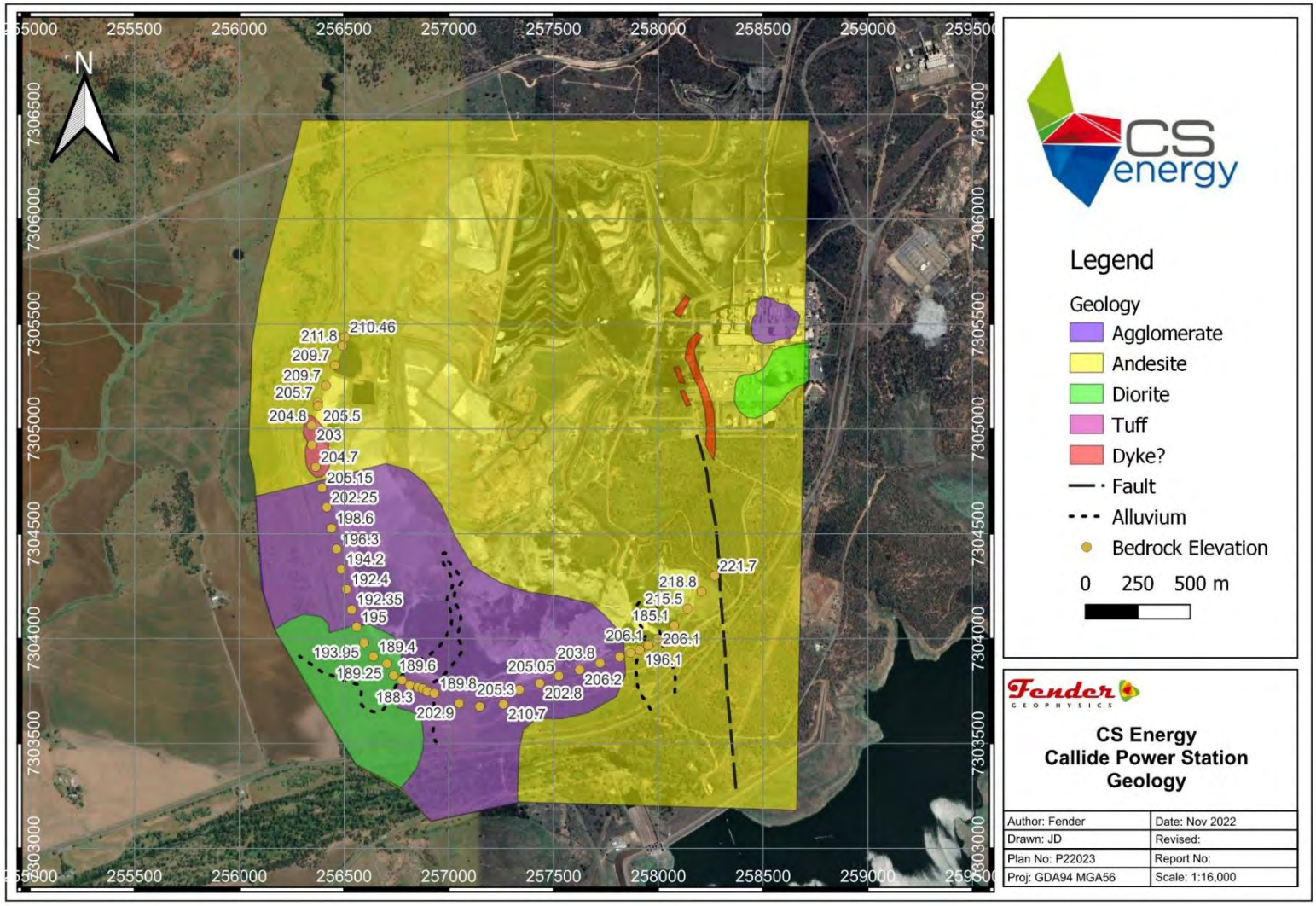


Figure 5. Geology of the Callide Ash Dam B site. Depth to bedrock measurements from bores around the perimeter of the dam are shown

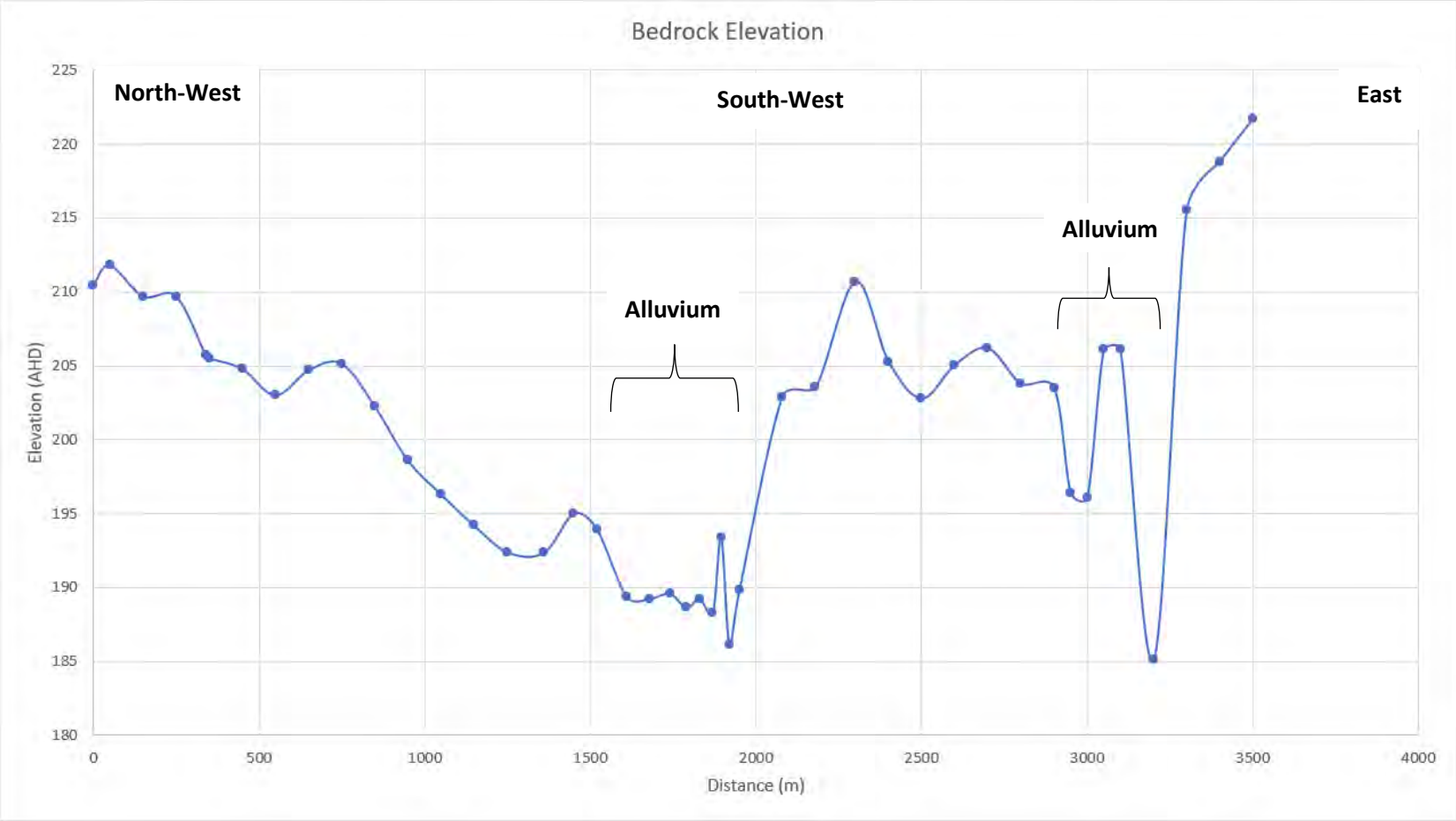


Figure 6. Bedrock elevations from dam perimeter (locations on Figure 5)

3.2 Resistivity Data Acquisition

The resistivity method is one of the oldest and most frequently used geophysical survey techniques. By taking measurements on the ground surface, electrical surveys aim to ascertain the subsurface resistivity distribution. The true resistivity of the subsoil can be calculated from these observations. The porosity, degree of water saturation in the rock, mineral and fluid content, as well as other geological factors, are all related to the ground resistivity (Figure 7). For many years, hydrogeological, mining, geotechnical, environmental, and even petroleum exploration have all used electrical resistivity studies for subsurface mapping and exploration.

The fundamental physical law used in resistivity surveys is Ohm's Law that governs the flow of current in the ground. The equation for Ohm's Law for current flow in a continuous medium is given by:

$$V = IR$$

where R is the conductivity of the medium, I is the electrical current and V is the applied voltage. We note that in geophysical surveys the measured resistivity is equal to the reciprocal of the conductivity.

The basic setup for a resistivity survey involves using a resistivity meter and four electrodes, however, modern resistivity systems are 'multi-channel' and automate the acquisition of resistivity values throughout an 'array' of electrodes. The resistivity meter is a device that acts as both a voltmeter (measuring V) and an ammeter (measuring I) and records resistance values (V/I). These resistance values are converted to apparent resistivity values using the formula:

$$\rho_a = \frac{\kappa V}{I}$$

where ρ_a = apparent resistivity and k = geometric factor. The geometric factor varies based on the geometry of each electrode spacing setup. In typical field work, data is acquired as an apparent resistivity. The apparent resistivity value is not the true resistivity of the subsurface, but an "apparent" value that is the resistivity of a homogeneous ground that will give the same resistance value for the same electrode arrangement. The relationship between the "apparent" resistivity and the "true" resistivity is a complex relationship. To determine the true subsurface resistivity from the apparent resistivity values is an "inversion" modelling problem.

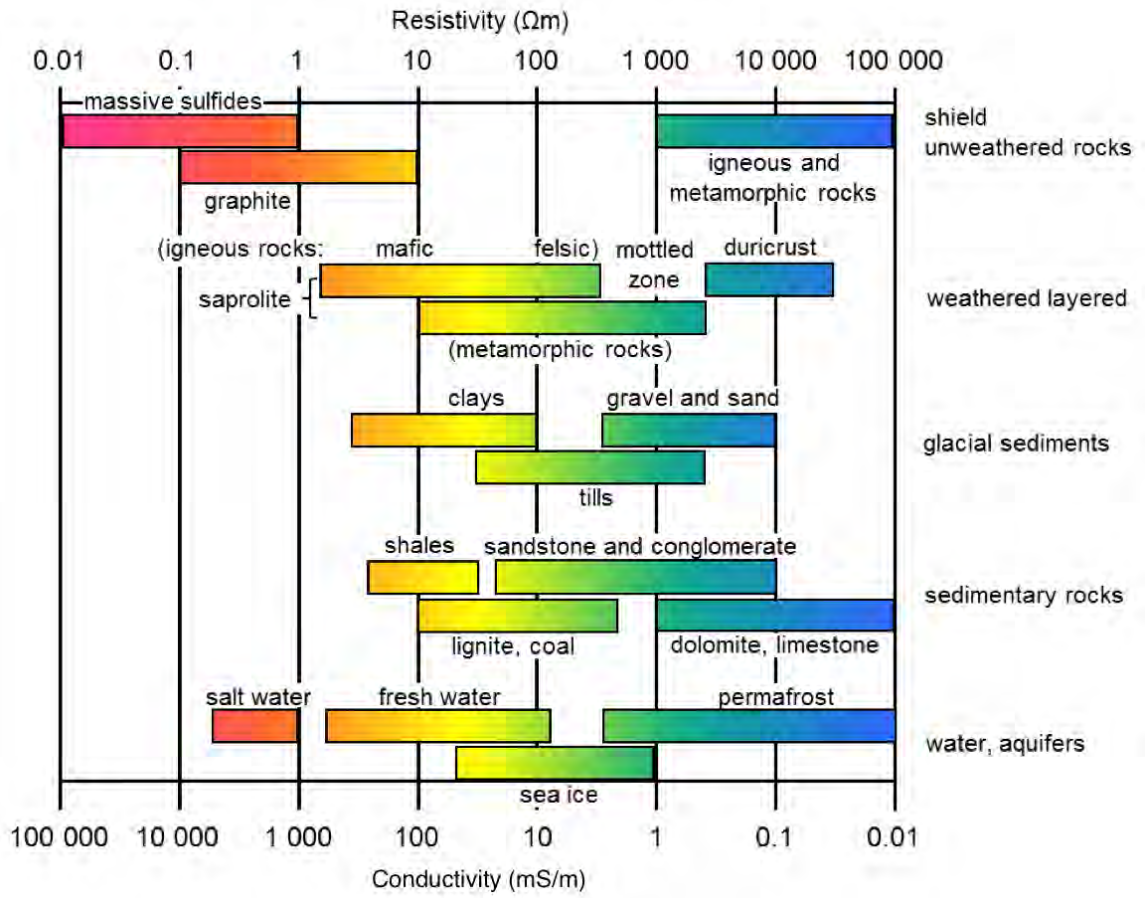


Figure 7. Generalised resistivity of rocks, soils, and aquifers.

Fender Geophysics use the Res2Dinv software for the inversion of 2-D resistivity data. The 2-D model used by the inversion program consists of a large number of rectangular blocks that are loosely tied to the distribution of the data points in the acquired resistivity data. The distribution and size of the blocks are automatically generated by the program using the distribution of the data points as a rough guide. The depth of the bottom row of blocks is set to be approximately equal to the median depth of investigation of the data points with the largest electrode spacing (i.e., the electrodes that are imaging to the deepest depths).

Starting from an initial model (usually a homogenous earth model), the program calculates the change in the model parameters that will reduce the difference between a calculated resistivity model and measured apparent resistivity values. The inversion adjusts the resistivity of the model blocks subject to the smoothness constraints that have been selected. A measure of this difference is given by the root-mean-squared (RMS) error. However, the model with the lowest possible RMS error sometimes show large and unrealistic variations in the model resistivity values and might not always be the "best" model from a geological perspective. In general, the most prudent approach

is to choose the model at the iteration after which the RMS error does not change significantly. This usually occurs between the 3rd and 6th iterations.

Multichannel resistivity profilers acquire data with a triangular-shaped cross section. Data is acquired to a maximum depth in the center of the profile, while the data is shallow towards the start and end of the profile. A 50% roll along survey involved moving the resistivity profile ½ of the array length before acquiring more data. The 50% roll along ensure that there is 100% data coverage at ½ the maximum depth of the survey. However, the 50% roll along method also creates gaps in the data at depth where there is minimal overall between adjacent profiles. Measured or apparent resistivity profiles are commonly compared with inversion models to assess data coverage and gaps under profiles. Resistivity profiles can have anomalous 'vertical' structures at depth. These vertical structures occur where the inversion process attempts to project low resistivity zones deeper than is supported by the data acquired measured resistivity. These artefacts are identified in the survey profiles.

The survey was conducted under consistent application of the relevant health and safety legislation. For details refer to the Survey Safety Plan, the induction records, and safety meeting minutes.

Prior to entering the field, waypoints were generated for electrode locations. These waypoints were imported into the Avenza mobile app and used for navigation and locating survey lines.

The resistivity data was acquired using a ZZgeo 64 channel resistivity system (Figure 8). An electrode spacing of 5m was used with a dipole/dipole array. Field data was acquired by a geophysicist with the following processes in place:

- Bollards were deployed for each profile for staff safety (Figure 9).
- All electrodes were watered using salty water (~200-500ml per electrode)
- Manual recording of station location and checking of contact resistance for all electrodes
- Verification of signal stability for all electrodes
- 50% overlap between arrays to ensure comprehensive coverage and data repeatability.
- Data and any cultural features were recorded in the operator's field notes for review in conjunction with later quality control.
- Resistivity data were acquired at all sites
- Raw waveform data was acquired at all sites.
- 1 second read times were used at all sites.
- Datasets were checked each night for quality and consistency between adjacent profiles

Station Spacing	5m
Resistivity Array	Dipole-Dipole
Number of Electrodes	64 electrodes were used for all survey lines except where fences/ponds limited access
Survey/Positioning Datum	GDA94 MGA56
Elevation Datum	Australian Height Datum (AHD)

Table 3. Acquisition Parameters



Figure 8. Typical survey layout showing ZZgeo unit and tablet for data acquisition. Equipment was powered using a deep-cycle battery.



Figure 9. Data acquisition focused on roadsides where access was good and deployment of electrodes was easy. Bollards were used to show other vehicles on the site where Fender staff were working. Image taken south of Ash Dam B facing west.

3.3 Production summary and initial results

Fender staff arrived on site on the afternoon of 08/08/2022. Staff spent most of 09/08/2022 undertaking site inductions and safety meetings, with some testing of the equipment started on that afternoon. Data acquisition occurred between 10/08/2022-13/08/2022 and 15/08/2022-19/08/2022 (Table 4). Sunday (14/08/2022) was a mandated rest day consistent with CS Energy WHS policies.

Data acquisition on 10/08/2022 was slow due to issues with frequently blowing fuses on the ZZgeo system. Field testing revealed this to be caused by high current draw on the system due to the highly conductive subsurface. After lowering the input voltage and determining data quality was still acceptable, data acquisition continued at an acceptable rate for the rest of the survey.

The resistivity returned from the electrode test ranged from 100-5000 Ohm.m. The system determined an optimum input voltage of 360V, however due to the fuse issue noted in the preceding paragraph, output voltages were maintained at 120V for the entire survey.

Production rates were excellent through the survey. Staff acquired 5 profiles on most survey days. A maximum of 6 was acquired on 1 day. Factors that limited data acquisition included:

1) Identification of the current draw issue and the need to purchase additional fuses
2) The presence of long grass (i.e., the southwestern corner of the field area)
3) Lines that were not 'roll-along', i.e., all equipment needed to be retrieved and moved to a new area.
4) A 2-hour break for wet weather on 13/08/2022

Surface resistivities were highly variable throughout the survey area. The surface substrate ranged from:

1) wet clays along the southern and western margins
2) sands, gravels clays along the southern margin of the dam
3) frequent shallow rock in the south-eastern survey area (lines 1-3)
4) rock and rubble at the start of line 13.

On completion of the field work all electrodes and cables were removed, and all electrode sites returned to their pre-survey state. All field supplies were removed from the survey site.

Date	Line	Start_X	Start_Y	End_X	End_Y
9/08/2022	Line_14_0	257111	7303690	257413	7303753
10/08/2022	Line_14_1	257113	7303706	257418	7303763
	Line_14_2	257271	7303727	257569	7303804
	Line_14_3	257430	7303767	257723	7303841
11/08/2022	Line_14_4	257577	7303807	257887	7303855
	Line_14_5	257726	7303841	258026	7303914
	Line_14_6	257885	7303854	258142	7304014
	Line_04_1	258035	7303906	258274	7304101
	Line_04_2	258144	7303999	258395	7304208
12/08/2022	Line_07_1	256399	7305542	256246	7305272
	Line_07_2	256326	7305408	256196	7305132
	Line_07_3	256249	7305281	256173	7304969
	Line_06_1	256123	7305272	256173	7304969
	Line_06_2	256128	7305125	256206	7304819
13/08/2022	Line_06_3	256176	7304962	256237	7304670
	Line_06_4	256208	7304820	256270	7304507
	Line_06_5	256235	7304663	256319	7304358
	Line_06_6	256274	7304519	256356	7304189
	Line_06_7	256315	7304360	256382	7304052
15/08/2022	Line_06_8	256349	7304203	256419	7303894
	Line_06_9	256386	7304047	256448	7303739
	Line_06_10	256425	7303895	256510	7303592
	Line_06_11	256474	7303771	256543	7303461
	Line_08_1	256615	7303774	256893	7303637
	Line_08_2	256757	7303703	257047	7303636
16/08/2022	Line_01_1	258516	7303694	258237	7303839
	Line_02_1	258373	7303575	258099	7303685
	Line_03_1	258528	7303550	258243	7303633
	Line_12_1	256552	7303457	256870	7303492
17/02/2022	Line_12_2	256726	7303478	257027	7303510
	Line_12_3	256870	7303492	257177	7303525
	Line_12_4	257020	7303517	257334	7303537
	Line_12_5	257172	7303519	257498	7303561
	Line_12_6	257332	7303548	257650	7303583
18/08/2022	Line_12_7	257498	7303561	257655	7303583
	Line_11_1	257497	7303557	257801	7303627
	Line_11_2	257655	7303583	257938	7303693
	Line_10_1	257802	7303625	258063	7303800
	Line_10_2	257938	7303703	258168	7303919
	Line_9_1	258068	7303800	258274	7304031
19/08/2022	Line_9_2	258169	7303923	258375	7304148
	Line_9_3	258282	7304029	258469	7304296
	Line_13_1	256736	7303626	256555	7303459

Table 4. Survey production summary.

3.4 Data processing

Data was downloaded from the receiver at the end of each day of the survey. Initial QC of the data was undertaken by Fender at camp after each day. The raw resistivity data was assessed using the FlashRES software for overall data quality and consistency. The data was then exported in Geosoft ASCII format and loaded into Res2Dinv for geophysical inversion modelling. Final plots of the resistivity profiles were made using QGIS.

1. Data files were imported into the **ZZ_Rdatacheck** software.
2. The files were visually inspected, and quality ('Q') thresholds were set to 30. An *.inp file was generated for further analysis and processing
3. The *.inp file was opened in **flash2res2inv** and the resistivity data were exported into a *.dat file for inversion **using Res2Dinv**.
4. The *.dat files were imported into **Res2Dinv** and then edited to remove erroneous measurements from the data. This editing was repeated 2-3 time if required.
5. Many of the survey lines consisted of multiple profiles (table 4). These lines were concatenated into single profiles before inversion.
6. The data then underwent geophysical inversion to convert the apparent resistivity data into models of measured resistivity. A 'robust inversion' was used.
7. From **Res2Dinv,** the inversion files were exported in an XYZ ASCII format. These text files were converted into *.tif images and imported into QGIS to produce pseudo-section plots.

4.0 DATA ANALYSIS

Data acquisition was split into five spatial domains for acquisition and interpretation:

1) The western margin of the property
2) The southern margin of the dam
3) The southern margin of the property
4) The south-eastern groundwater profiles
5) The western stormwater diversion channel

Boreholes from the Callide Power Station site were used to aid the interpretation of the resistivity data. As well as providing observations of geology and the nature of weathering or fracturing, the bores provide indications of moisture, standing water level (SWL), and depths of groundwater sources. SWL is the distance from the ground surface to the water surface. Depths of groundwater sources are exactly that. SWL is influence by local and regional hydraulic gradients and is often shallower than the groundwater source.

Domain	ERI Lines	Bores
The western margin of the property	6,7	128671, MW26, MW60, 170017A, MW27, MW56
The southern margin of the dam	14,5,4	MW36, 170113A, MW64, ESC1, MW29, MW24
The southern margin of the property	12,11,10,9,8	170020A. MW28D, MW49, MW53, MW50, MW48, MW78, MW65, MW51, MW52, MW30, MW13
The western stormwater diversion channel	8+13	MW58, 128838A, MW40, 128681
The south-eastern groundwater profiles	1-3	MW32, MW33, MW31, MW43

Table 5. Survey domains and lines with adjacent boreholes

4.1 Identification of drill sites

The geophysical survey undertaken on the Callide Power Station site aimed to identify potential sources of groundwater and dam seepage, especially at depth in fractured rock aquifers to aid in managing PFAS contamination and migration. Additional sites for drilling to better monitor and manage PFAS migration need to be located.

Fender have provided:

1. Coordinates of proposed drilling locations
2. Drilling locations identified on transects
3. A short paragraph justification for each
4. A qualitative ranking of the sites.

Presently there are several unknowns and data gaps in the information provided which have limited a full interrogation of the survey site and proposed bore locations. These gaps include:

1. There have been numerous bores/ wells drilled on site but drilling logs have only been provided for a small number of these: i.e. boreholes exist for 'depth to bedrock' around the perimeter of the dam (Figure 5) but there is no accompanying borehole geology
2. PFAS testing results have been provided for a small number of bores only. These are the only bores that have been tested
3. It is unclear if these bores have been sampled and tested on more than a single occasion.
4. The obvious near-surface seepage channels in the alluvial sediments are well characterized, but deeper groundwater flow is not well-defined by the provided bore logs with most bores only drilled to shallow depth in alluvium and/or regolith. There is evidence of deeper groundwater flow in the deeper monitoring bores in layers of fractured andesite. Elevated PFAS appearing in bores such as MW32 and MW33 that have no potential shallow groundwater connection to the dam also confirm some deeper groundwater flow in the hard rock.
5. Basement profiling from the bore logs along the dam wall (Figure 5), also indicate some basement irregularities that may potentially be related to fracturing and faulting near the eastern edge. No bore logs were available for the bores along the dam wall and no PFAS test results were shown at these bores so the exact nature of the geology in that area is hard to determine.

4.2 Western margin of the property

Survey lines 6 and 7 mapped the western margin of the Callide Power Station site (Figure 10). Line 6 was orientated NNW/SSE followed the western fence line along the cleared fire trail. For interpretation purposes the line is split in to two parts (A and B). Line 7 trended NNE/SWW but merged with Line 6 at its southern end. Six bore holes (Figure 11) were used to ground truth lines 6 and 7 (128671, MW26, MW60, 170017A, MW27, MW56).

The upper 10-20m of the resistivity profiles have low resistivity (<10 ohm.m). This is likely driven by the high clay content in the soil and numerous shows of groundwater in the adjacent bores (Figure 12-14). All the bores show groundwater or traces of moisture within the upper clay and mixed clay/sand/gravels above the bedrock. Bedrock can be identified where resistivity increases rapidly from 100-1000 Ohm.m. However, borehole data shows that the upper rock units are commonly highly weathered or fractured (i.e. bores RN170017 and MW27) and may act as a more 'gradational' boundary between the alluvium and hard rock. The surface of the interpreted bedrock is generally parallel or sub-parallel to the land surface. There are zones of low resistivity at depth within the profiles. Line 6 shows vertical low resistivity zones at 450m, 1230m, 1730m along the profile as well as an extended low resistivity zone between 1400-1500m along the profile (Figure 12, 13). Line 7 shows zones of low resistivity at 130m, 300m, and 530m, along the profile (Figure 14).

4.2.1 Proposed Borehole

Site 9 lies near the southern end of Survey Line 6b along the western embankment (Figure 10 and 13). The site is adjacent to mapped alluvium and is located in area of 'dominantly diorite'. This site is proposed because it targets the middle of a broad area of low to moderate resistivity indicative of potential moisture at depth. The site also fills a significant gap in the monitoring well spacing between MW56 at the southern end of the line and MW27 700m to the north. Although the site is located to fill a gap between existing bores the broad spread of low resistivity values is considered worthy of further investigation.

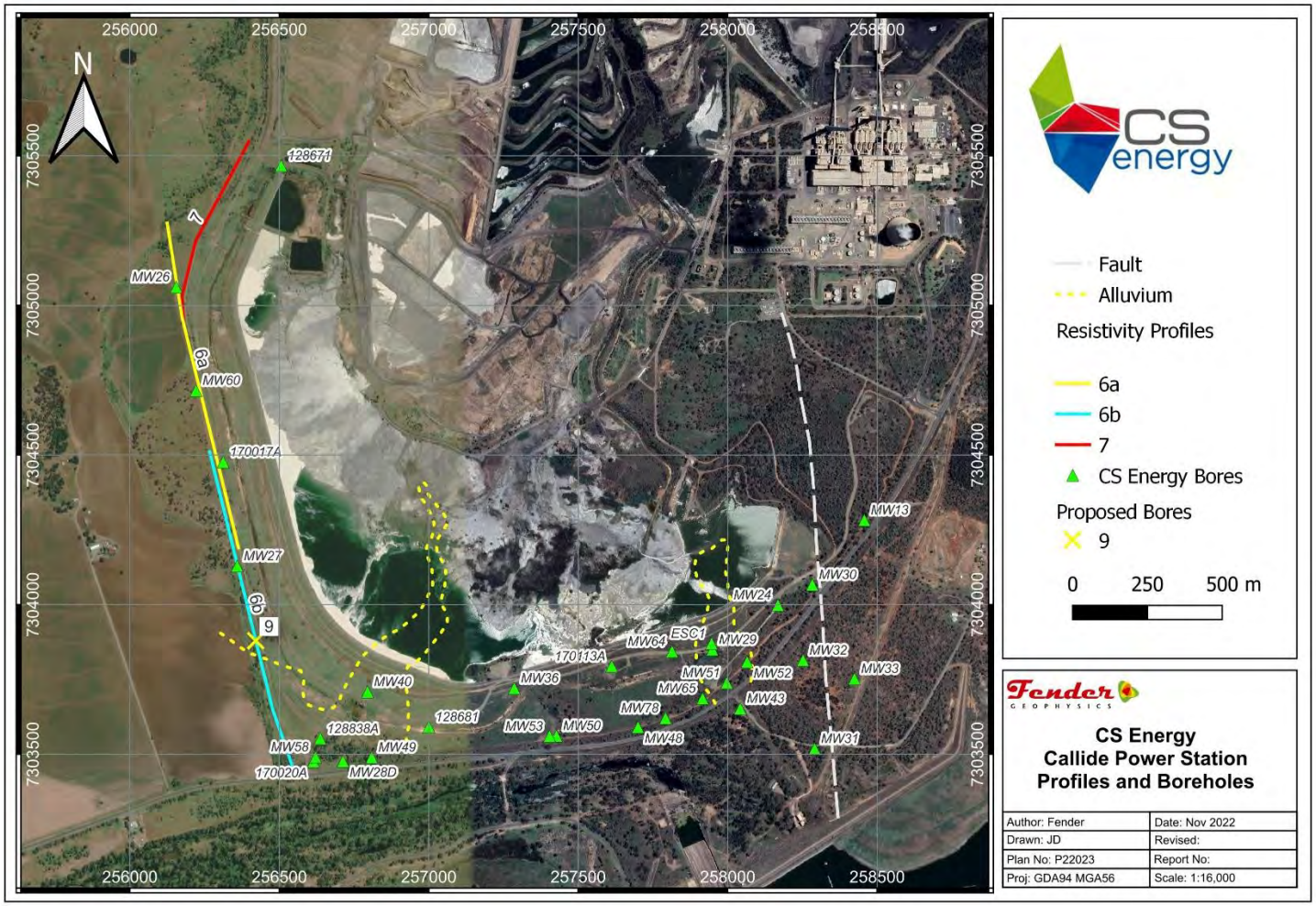


Figure 10. Geophysical survey lines and boreholes on the western margin of the Callide Power Station property.

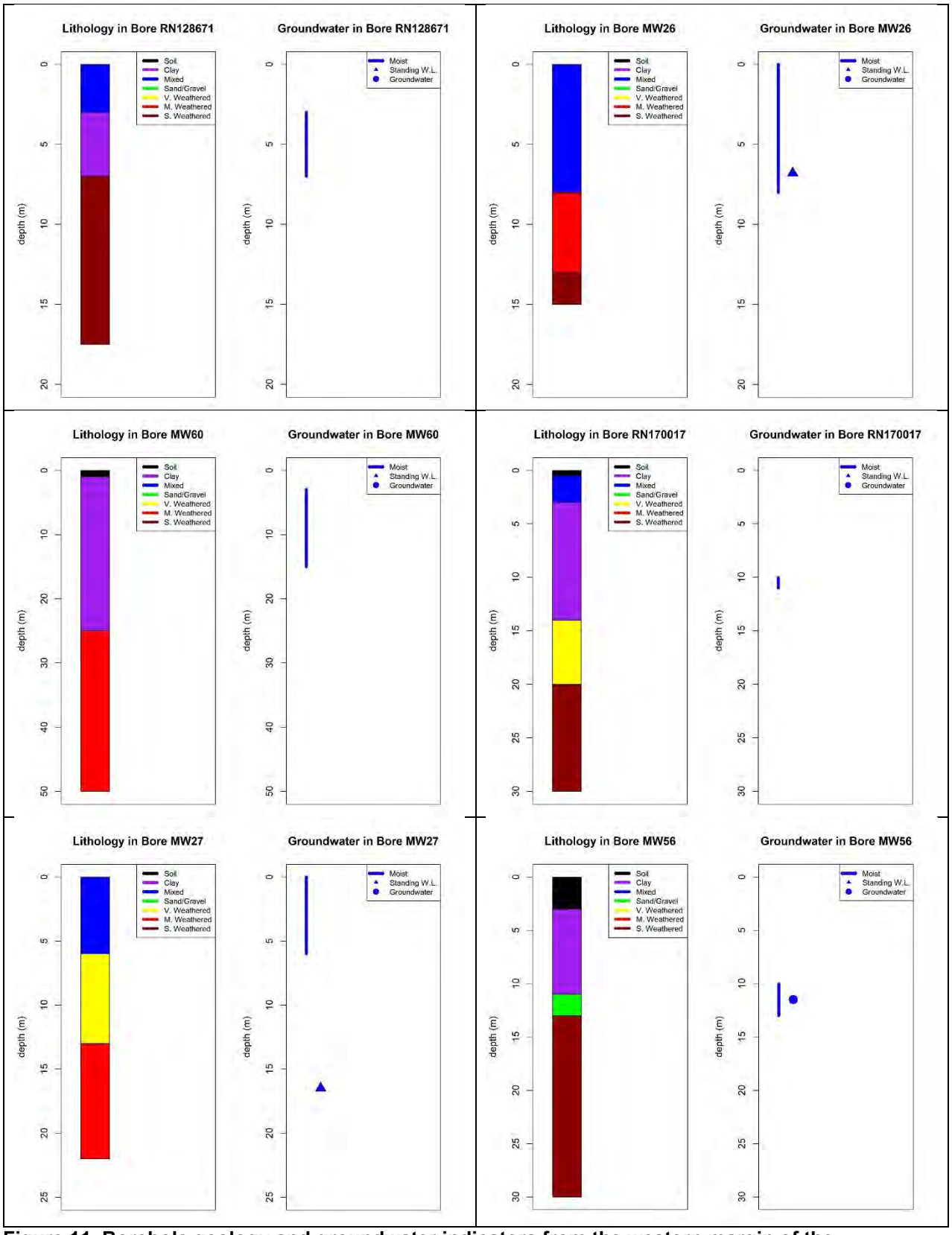


Figure 11. Borehole geology and groundwater indicators from the western margin of the Callide Dam property.

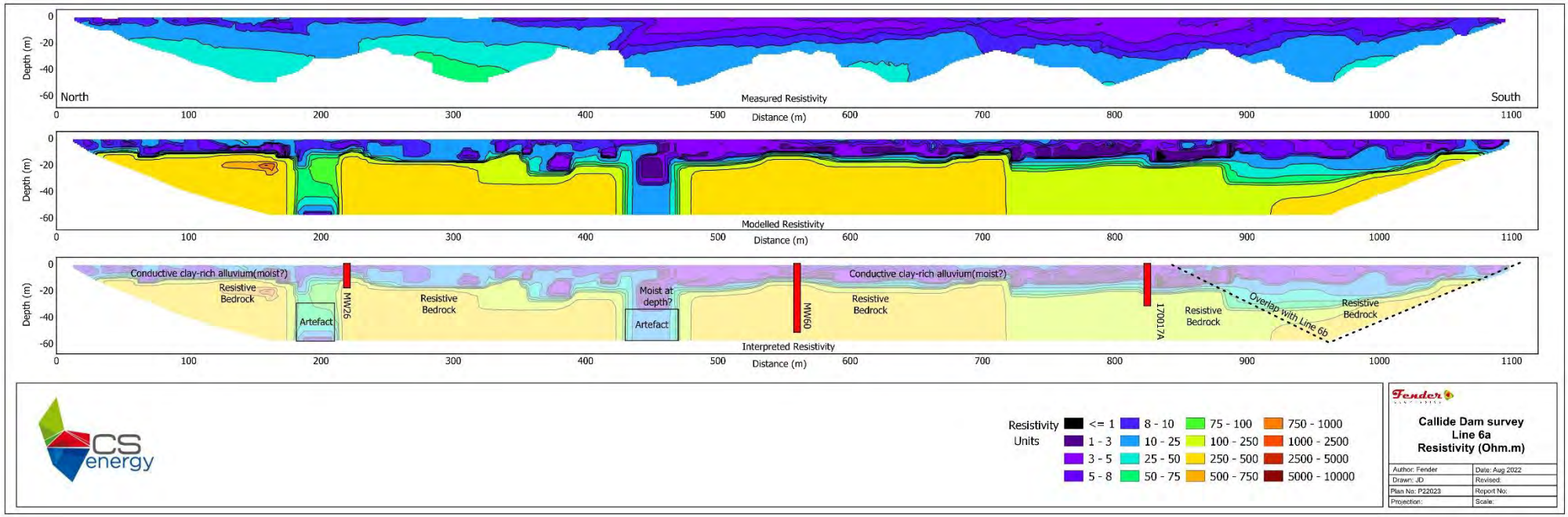


Figure 12. Resistivity data and interpretation for Line 6a (partially overlaps with line 6B).

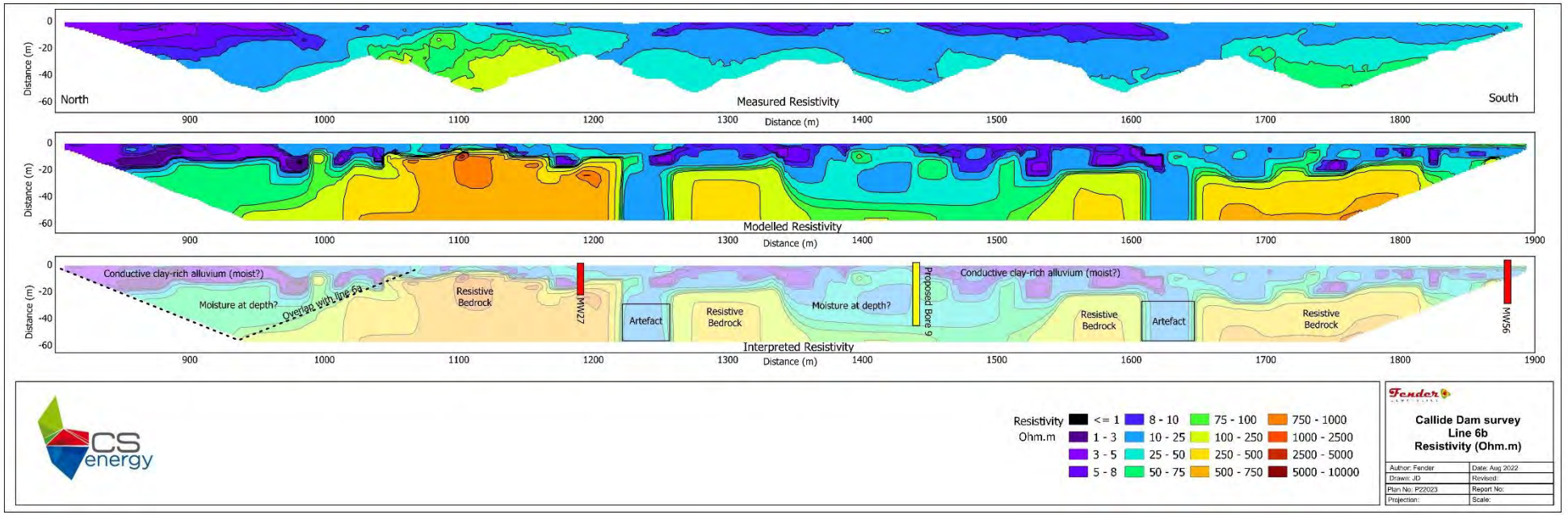


Figure 13. Resistivity and interpretation for Line 6b (partially overlaps with line 6A). Proposed bore 9 is marked (yellow).

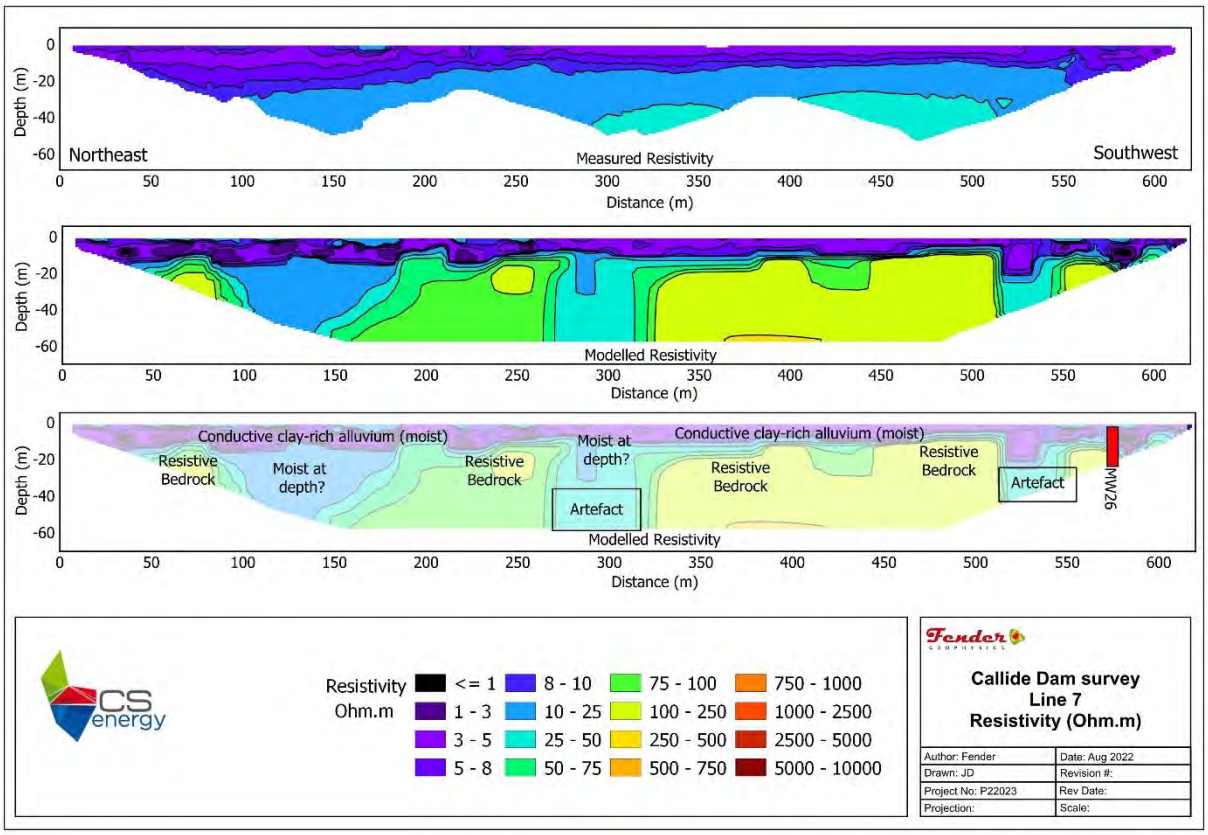


Figure 14. Resistivity and interpretation for Line 7.

4.3 Southern Margin of the Ash Dam

Survey lines 14, 5, and 4 mapped the southern margin of Ash Dam B (Figure 15). The three lines were orientated ENE/WSW. Six bore holes (MW36, 170113A, MW64, ESC1, MW29, MW24) were used to ground truth the resistivity profiles (Figure 16). Similar to the western profiles, the Ash Dam profiles are characterised by an upper conductive unit and a lower resistive unit that is assumed to separate an upper dominantly alluvium unit from a lower bedrock unit. However, the highly conductive alluvial unit is less continuous than is observed on the western margin of the property. Line 14 shows a thick (up to 20m) highly conductive unit at its western end extending from 0-200m along the profile (Figure 17). This unit is intersected by bore MW36 (which contains rock from 7m depth) and suggests that despite its high conductivity it might also be characterised by significant amounts of weathered/fractured rock which is also moist/wet. Further east along profile 14, rock is frequently interpreted at the land surface (i.e. bore MW64) or within a few meters of the land surface (i.e. bores RN170113 and ESC1). The thin and discontinuous nature of the alluvial unit is also observed in Lines 5 and 4 (Figure 18 and 19) further to the west. There appears to be change in the geophysical response of the bedrock between Line 14 (west) and lines 5 and 4 (east) with lower resistivity responses observed at depth to the east, this is possibly a result of different subsurface geology or more moisture at depth.

Groundwater is observed in all six bores along the profile with most occurrences of groundwater and moisture limited to the upper alluvium. There is some evidence of groundwater within bedrock at ~27m depth in bore MW64. Bore MW29 shows significant groundwater within bedrock at depths of 8-12m and evidence of moisture at all depths.

4.2.1. Proposed boreholes

Proposed boreholes 1, 2, and 3 all appear on Survey line 4 and overlap on 5 at the far eastern extent of the survey area. The geology is characterised as andesite and therefore promising in regard to its capacity to act as an aquifer. There is a broad area of low resistivity at both the eastern and western extents of survey line 4 and are targeted by bores 1 and 3. These 3 bores (as well as proposed bore 4) were chosen to help determine the potential pathways resulting in the elevated PFAS levels seen in the deeper bores (MW31, MW32, MW33 and MW43) to the south. While much of the PFAS contamination in the study area is observed in shallow bores and a result of seepage, these four bores were drilled deeper in hard rock that would require a deeper pathway for groundwater contamination to migrate to.

Site 1 was chosen due to the low resistivity values observed at depth at the eastern end of profile 4 and due to its correlation to the inferred fault on the geological map provided (Figure 19). If the fault does exist as inferred, it is potentially an explanation for the elevated PFAS seen in the deeper bores to the south (MW32 and MW33) as the fault system may be acting as a groundwater conduit at depth in the hard rock. Those 2 bores to the south have no potential shallow groundwater pathway due to the local topography so a deeper groundwater flow path must be present to explain the PFAS migration. It is likely PFAS migration to this area is very slow and the elevated PFAS seen is a concentration due to low groundwater velocity.

Site 2 was chosen as there is a significant hole in the deeper bore coverage in that area (Figure 18). It is near to the existing MW30 bore where AD contamination was noted but the hole was only drilled to 9m deep. Both Line 4 and 5 show low resistivity in the area extending to depth (but more prominent in the line 5), and there are no deep monitoring bores nearby.

Site 3 is in the middle of a deep area of low resistivity picked up on both Lines 4 and 5 and up gradient from MW43 where elevated PFAS was recorded (Figure 18 and 19). Other deep bores in the area (notably ESC1 and ESC3) were both recorded with significant groundwater flow at depth in fractured andesite.

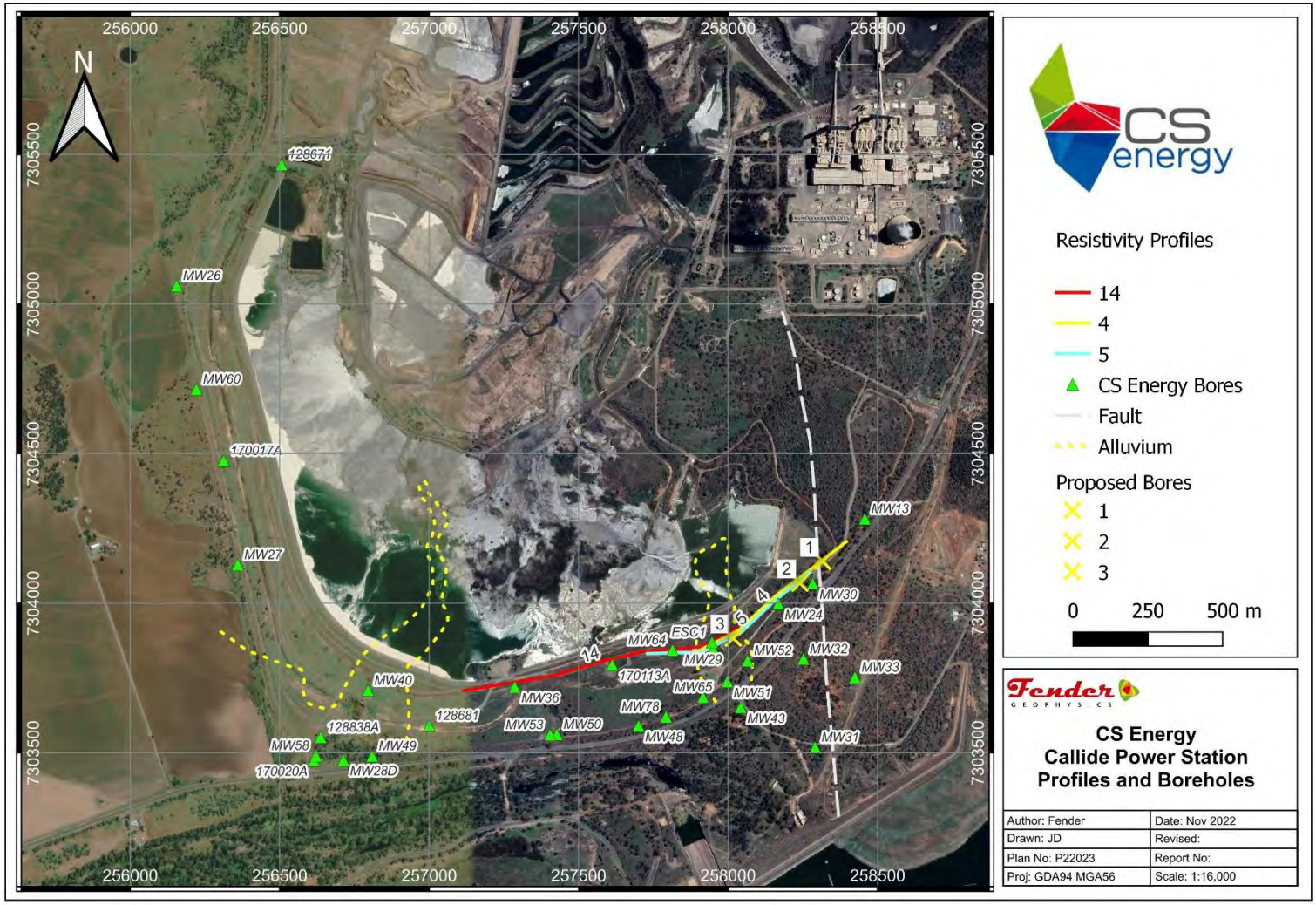


Figure 15. Geophysical survey lines and boreholes on the southern margin of Ash Dam B.

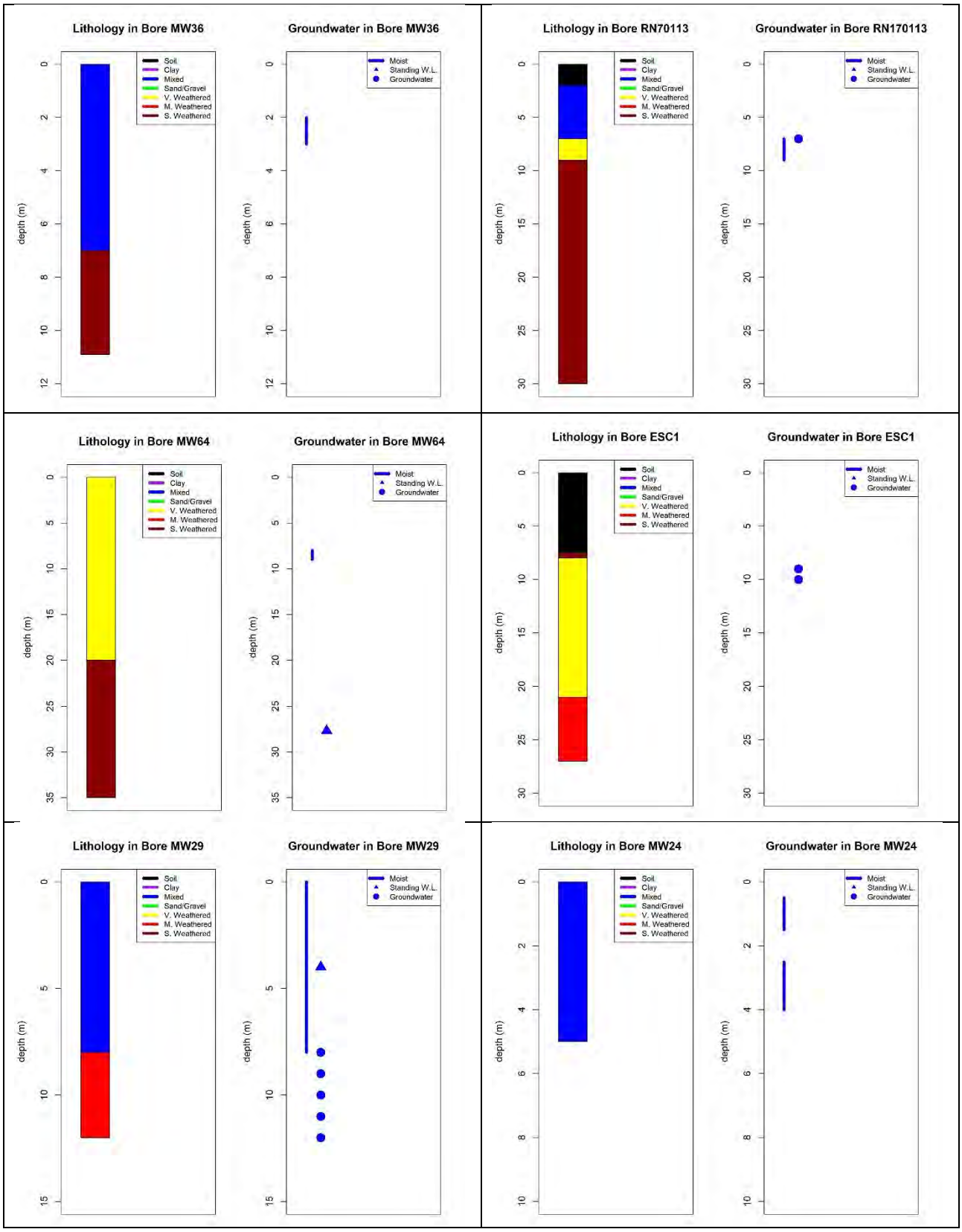


Figure 16. Borehole geology and groundwater indicators from the southern margin of the Callide Dam.

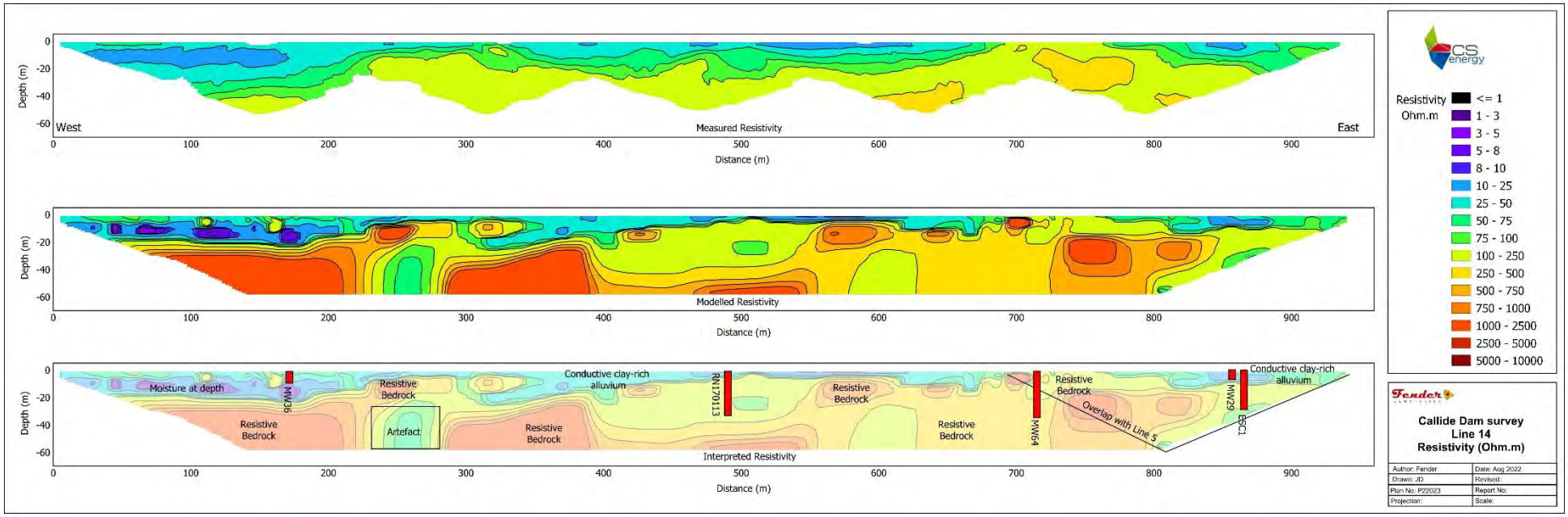


Figure 17. Resistivity and interpretation for Line 14 (partially overlaps with line 5).

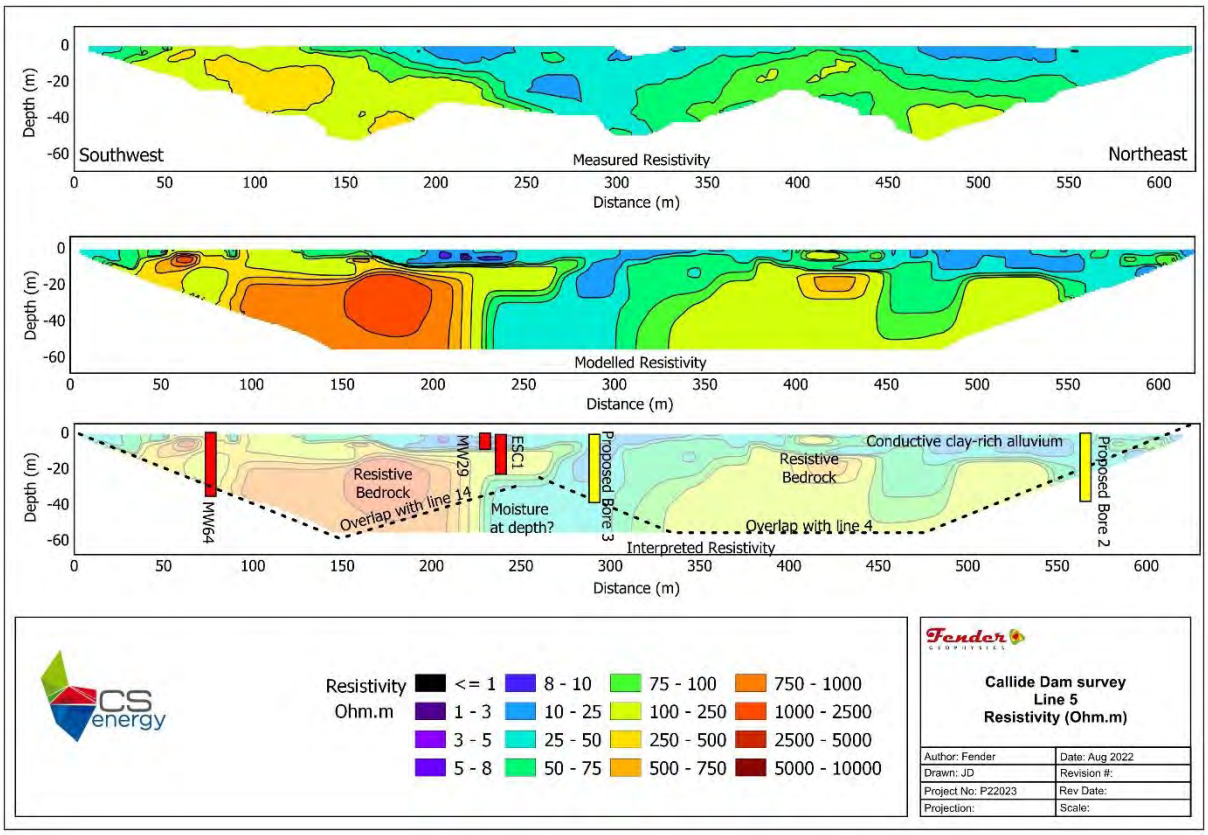


Figure 18. Resistivity and interpretation for Line 5 (partially overlaps with lines 14 and 4). Locations of proposed bores 2 and 3 are indicated (Yellow)

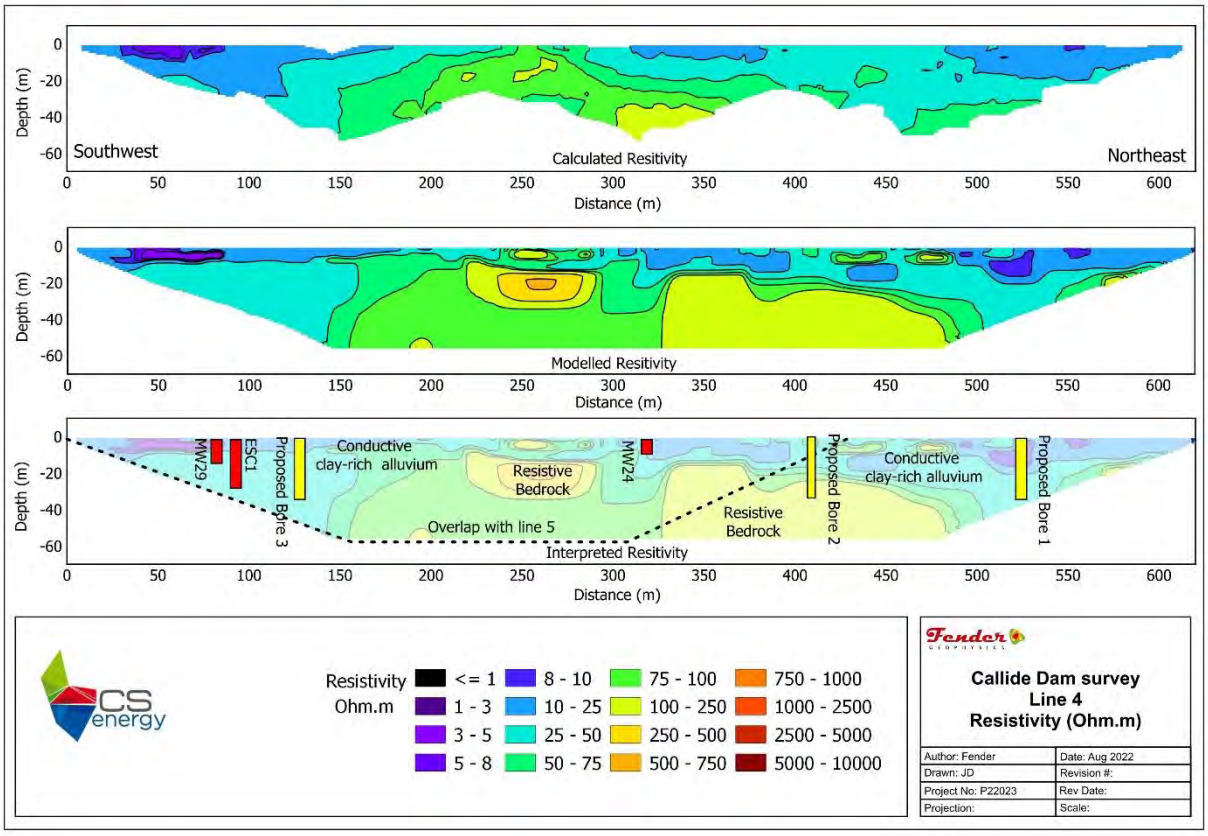


Figure 19. Resistivity and interpretation for Line 4 (partially overlaps with line 5). Locations of proposed bores 1, 2, and 3 are indicated (Yellow)

4.4 Southern Margin of the Property

Survey lines 12, 11 ,10, and 9 were mapped the southern margin of the Callide Power Station property (Figure 18). Lines 12 and 11 were oriented E/W, while lines 10 and 9 were orientated SW/NW. Twelve boreholes (Figure 19) were used to ground truth these profiles (170020A. MW28D, MW49, MW53, MW50, MW48, MW78, MW65, MW51, MW52, MW30, MW13).

Line 12 (Figure 20), the westernmost line, is characterised by an extensive upper conductive and dominantly alluvium unit from a lower resistive bedrock unit. This upper unit is continuous for 800m along the profile though it is less evident to the east. Boreholes 170020A, MW28D, MW49, MW53, and MW50 indicate depth to bedrock is approximately 5-12m throughout the profile. However, the conductive unit thickens substantially between 250-830m along the profile (to greater than 20m). No borehole data exists along this section of the profile; however, the data indicates that the alluvium is thicker or there is more moisture at depth at that location. Boreholes MW28D, MW49, and MW53 all show thick upper units of moist rock and alluvium.

Lines 11 and 10 (Figure 21 and 22) show the upper conductive and dominantly alluvium unit is more discontinuous with bedrock reaching the land surface or within a few meters of the land surface at some locations (i.e., bores MW48, MW78, MW65, MW51, and MW52). There is some evidence of moisture at depth with a low resistivity zone extending from 200-320m along Line 10 (and partially imaged in Line 11). Bores MW51 and MW52 show that this low resistivity zone is bedrock but likely more moist than the adjacent rock.

Line 9 (Figure 23) shows a continuous upper conductive and dominantly alluvium unit down to approximately 10m, with bore MW30 showing moisture down to depths of 9m (the base of the borehole). This unit deepens to 30-40m at 420-470m along the profile where there is possibly more moisture at depth.

4.3.1. Proposed boreholes

Boreholes 5, 6, and 7 are located along Survey Line 12 in the SW corner of the dam in the middle of the broad area of seepage identified there (Figure 20). Survey Line 12 shows an extended area of near surface seepage across almost the entire survey line excluding the most easterly 250m where elevated basement and high resistivity are observed. Boreholes 5, 6 and 7 all target specific areas in the broad expanse of seepage where low resistivity is seen extending to depths of 40m. They also help fill in an area where bores are relatively sparse compared to the coverage in the main areas of seepage.

Borehole 4 is adjacent to proposed boreholes 1-3. It is located to help determine the potential pathways resulting in the elevated PFAS levels seen in the deeper bores (MW 31, MW32, MW33 and MW43) to the south. The borehole is located within is a significant area of low resistivity at 420-470m along the Survey Line 9 profile extending to depth indicating possible moisture (Figure 23).

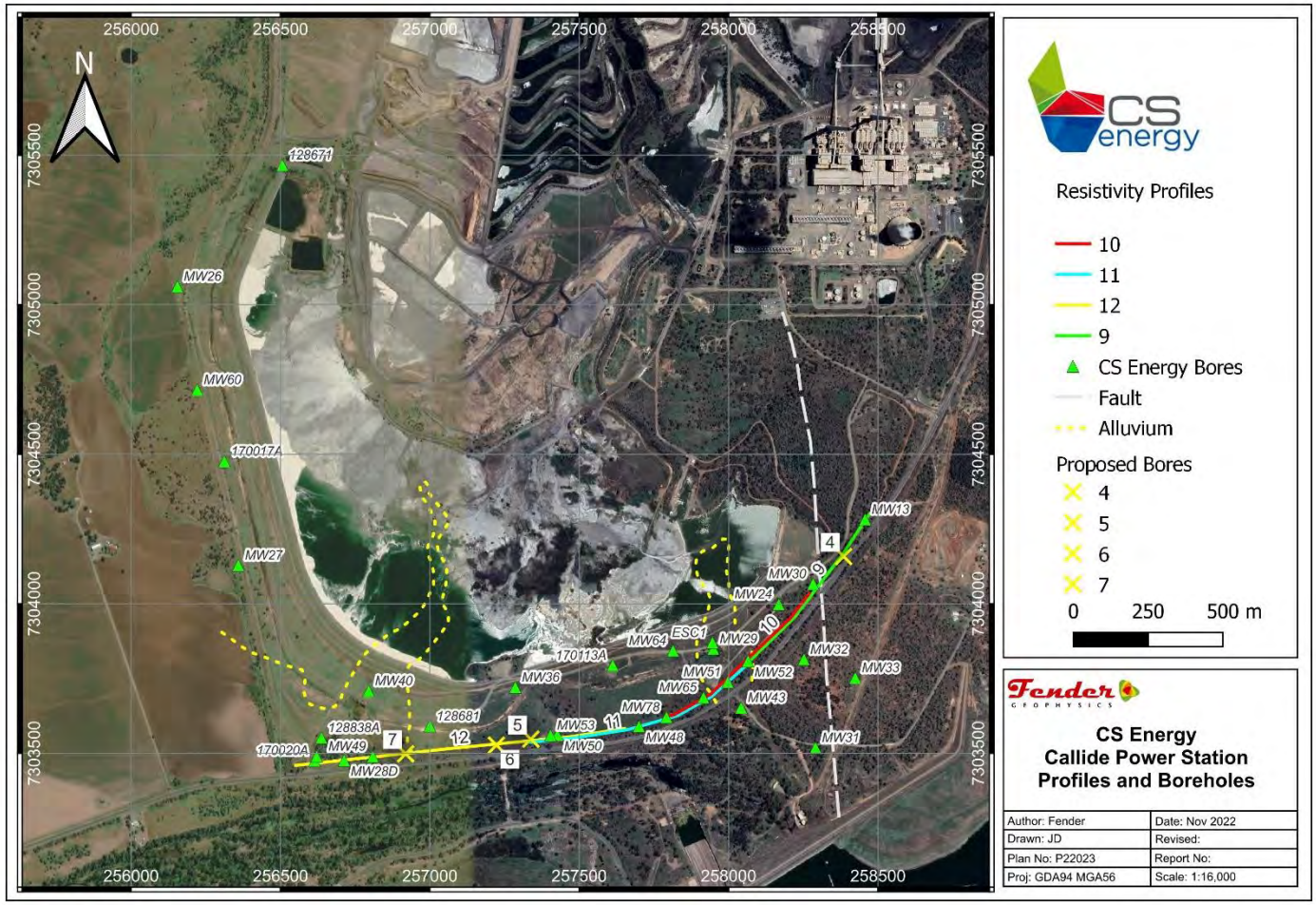


Figure 20. Geophysical survey lines and boreholes on the southern margin of the Callide Power Station property.

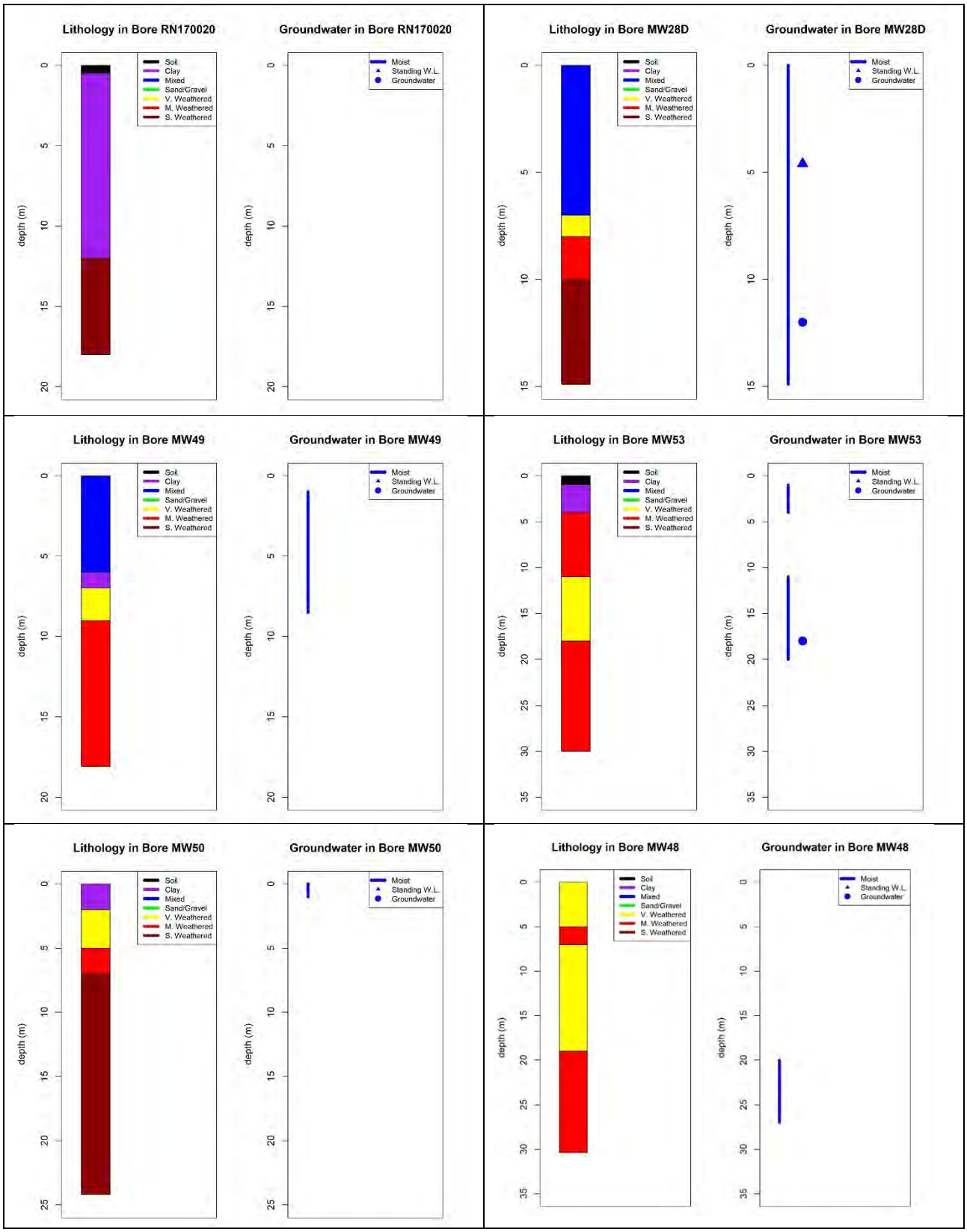


Figure 21a. Borehole geology and groundwater indicators from the southern margin of the Callide Dam property.

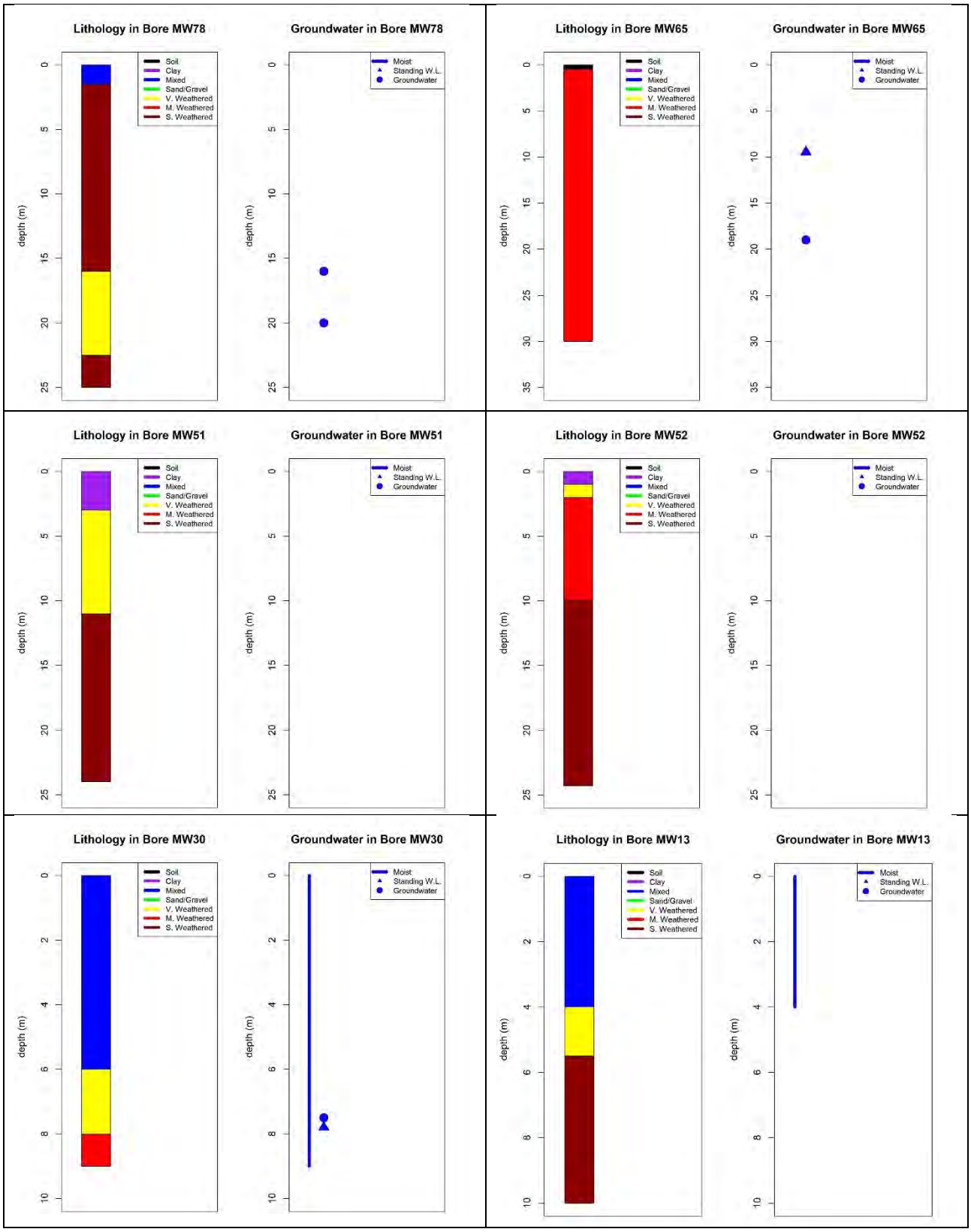


Figure 19b. Borehole geology and groundwater indicators from the southern margin of the Callide Dam property.

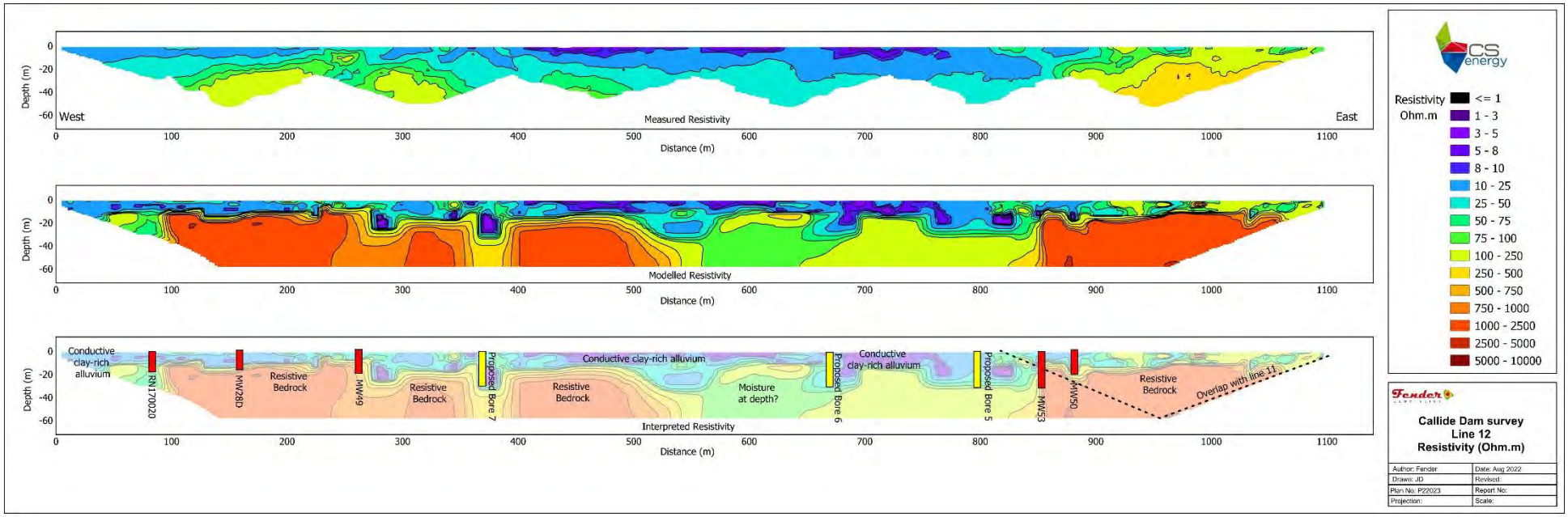


Figure 22. Resistivity and interpretation for Line 12 (partially overlaps with line 11).

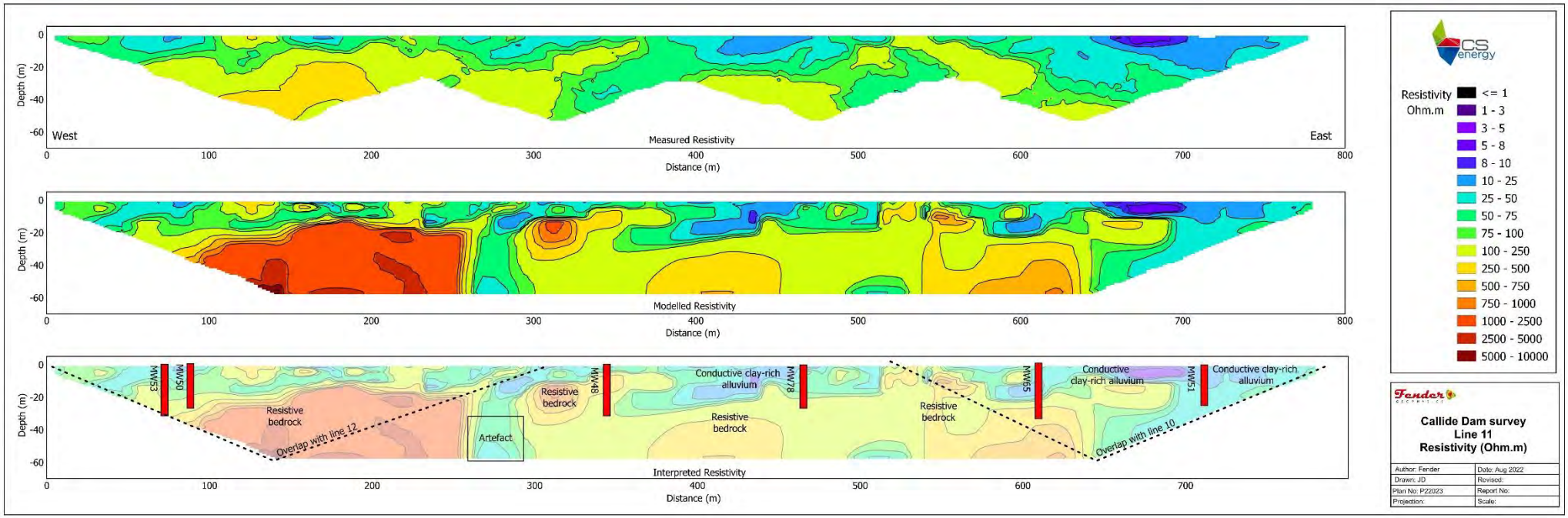


Figure 23. Resistivity and interpretation for Line 11 (partially overlaps with lines 12 and 10).

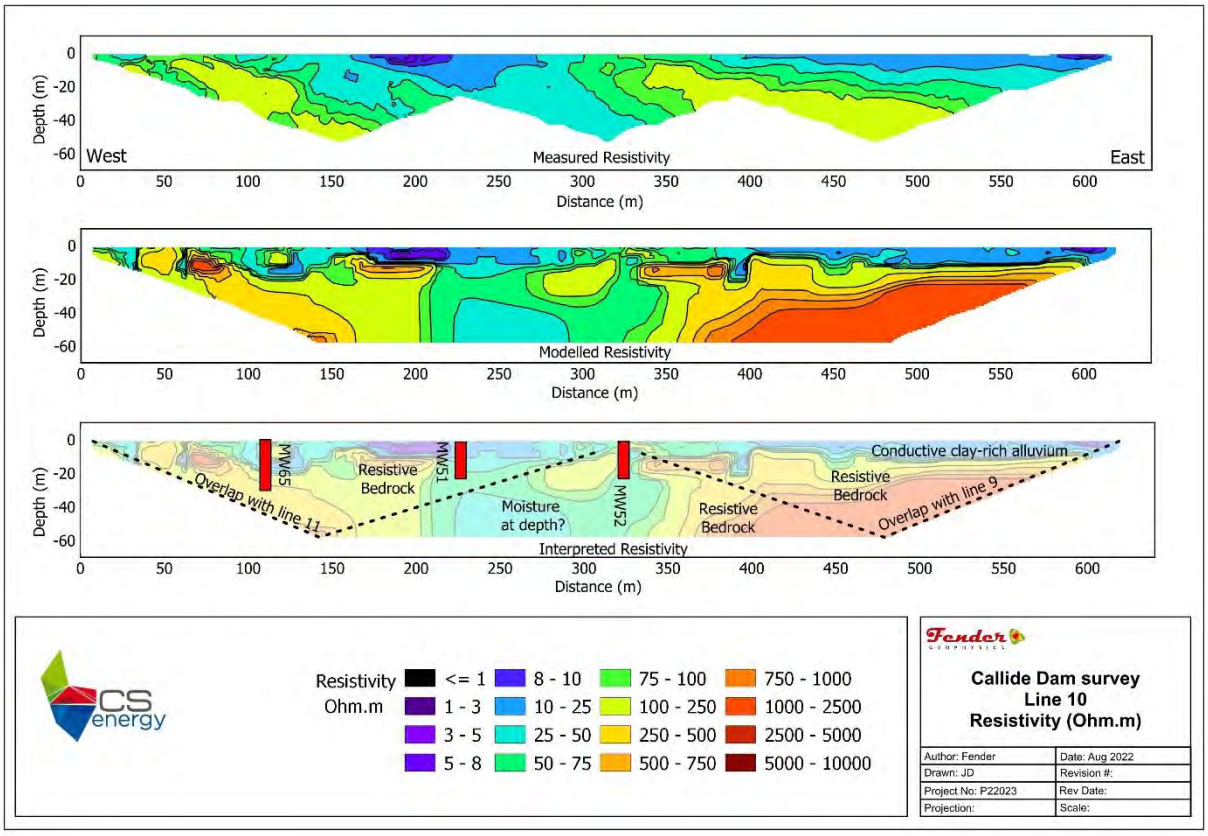


Figure 24. Resistivity and interpretation for Line 10 (partially overlaps with lines 11 and 9).

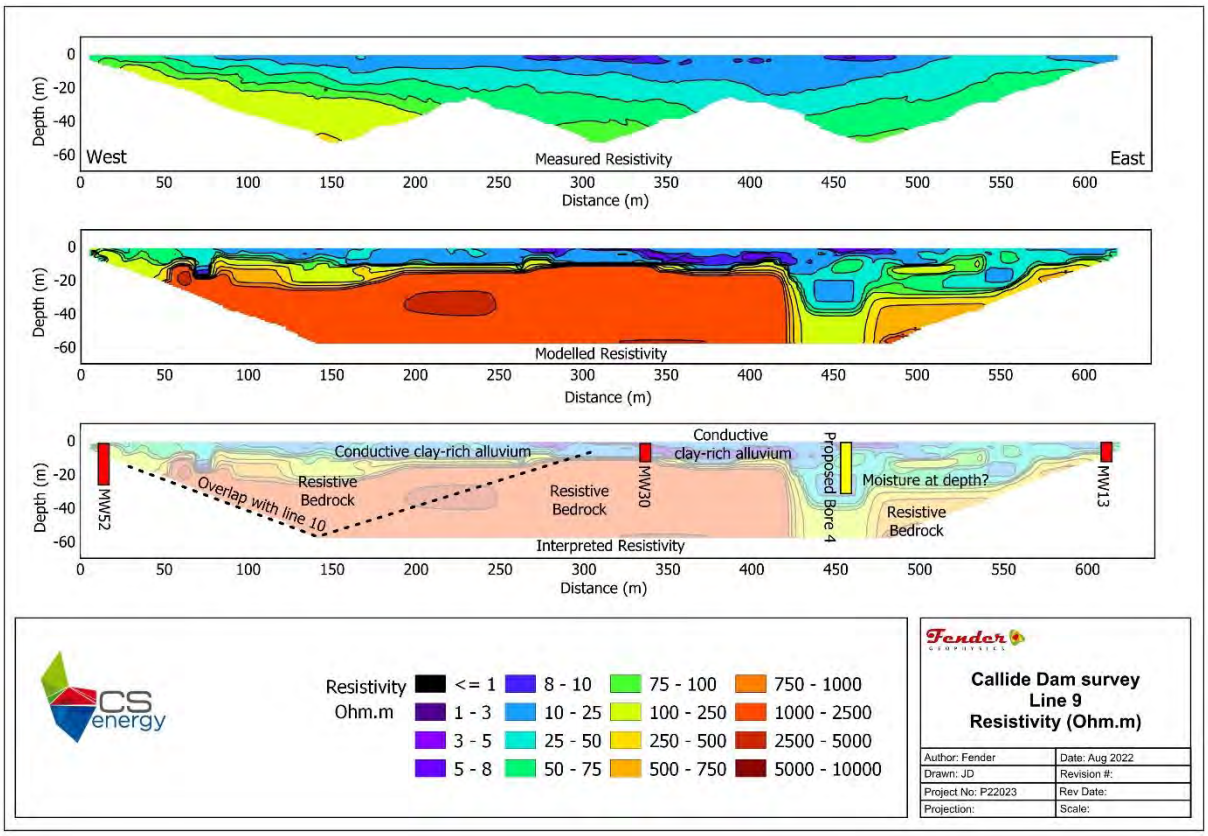


Figure 25. Resistivity and interpretation for Line 9 (partially overlaps with line 10). Location of proposed bore 4 marked (Yellow)

4.5 Western stormwater diversion channel

Two survey lines were acquired over the western stormwater diversion channel (Figure 24). These are lines 8 and 13. Line 8 was orientated NW/SE and adjacent to bores MW40 and RN128681 (Figure 25). Line 13 was orientated at SW/NW and adjacent to bores RN128838 and MW40.

Line 8 (Figure 26) is characterised by an upper conductive unit and a low resistivity unit that is assumed to separate an upper dominantly alluvium unit from a lower bedrock unit. The boundary between these units is typically 10m and is supported by bore MW40 showing the boundary at 9m (and moisture between 4 and 15m). The boundary between these units deepens to 30-40m between 250-350m along the profile and indicates moisture at that location.

Line 13 (Figure 27) extends from the SW corner of the Callide Dam property towards a drainage dam. This line is comparatively short as it was constrained by a dam to the north and a boundary fence to the south. Similar to most lines in this study the resistivity data shows an upper conductive unit (dominantly alluvium) and lower resistive unit (bedrock). However, the bedrock unit has a characteristically low resistivity of 100 Ohm.m. Despite the low resistivity at depth within the profile, bore RN128838 indicates bedrock from ~7m depth.

4.4.1. Proposed Borehole

Site 8 targets a strong contrast in resistivity from very high along the western edge of the survey to a resistivity low extending to depth at 240 – 270m along the survey line. If a deeper groundwater pathway exists in the southwest corner it is likely to be passing through Point 8. Both Site 8 and Site 7 are near bore MW49 where elevated PFAS was recorded and may intersect the potential deeper groundwater pathway involved. The area west of MW49 is well covered by the existing network of bores.

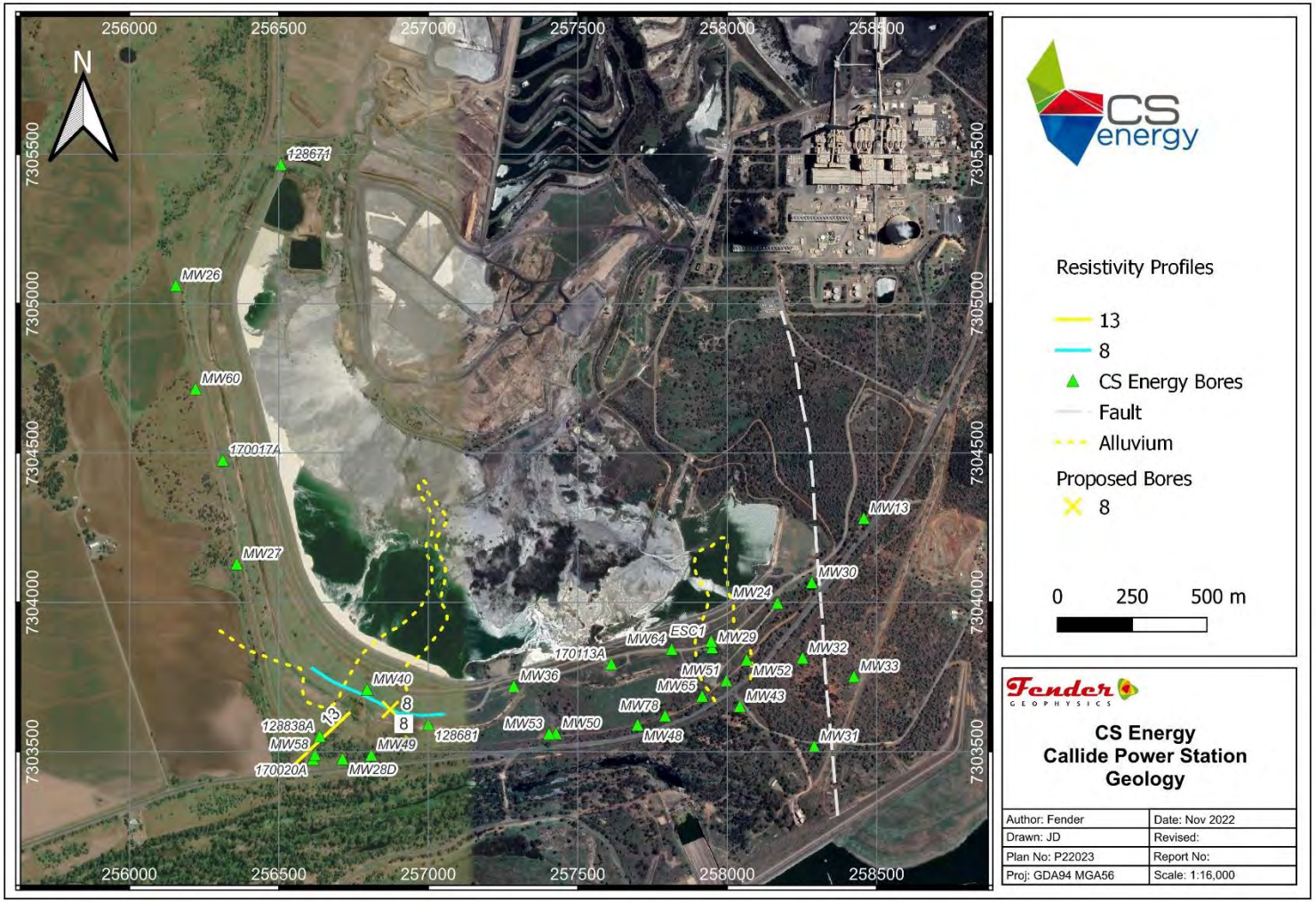


Figure 26. Geophysical survey lines and boreholes adjacent to the western stormwater diversion.

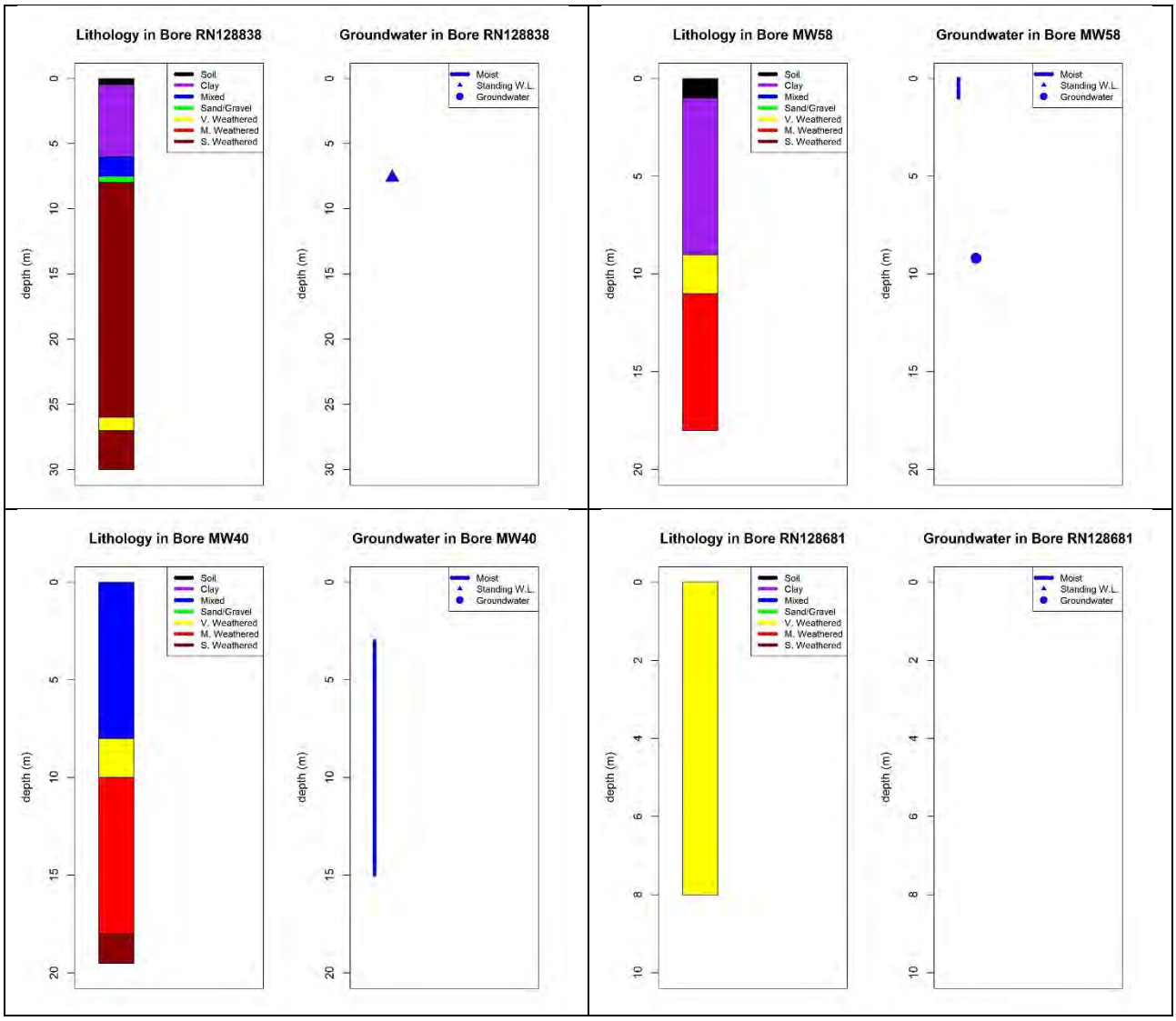


Figure 27. Borehole geology and groundwater indicators from the western stormwater diversion

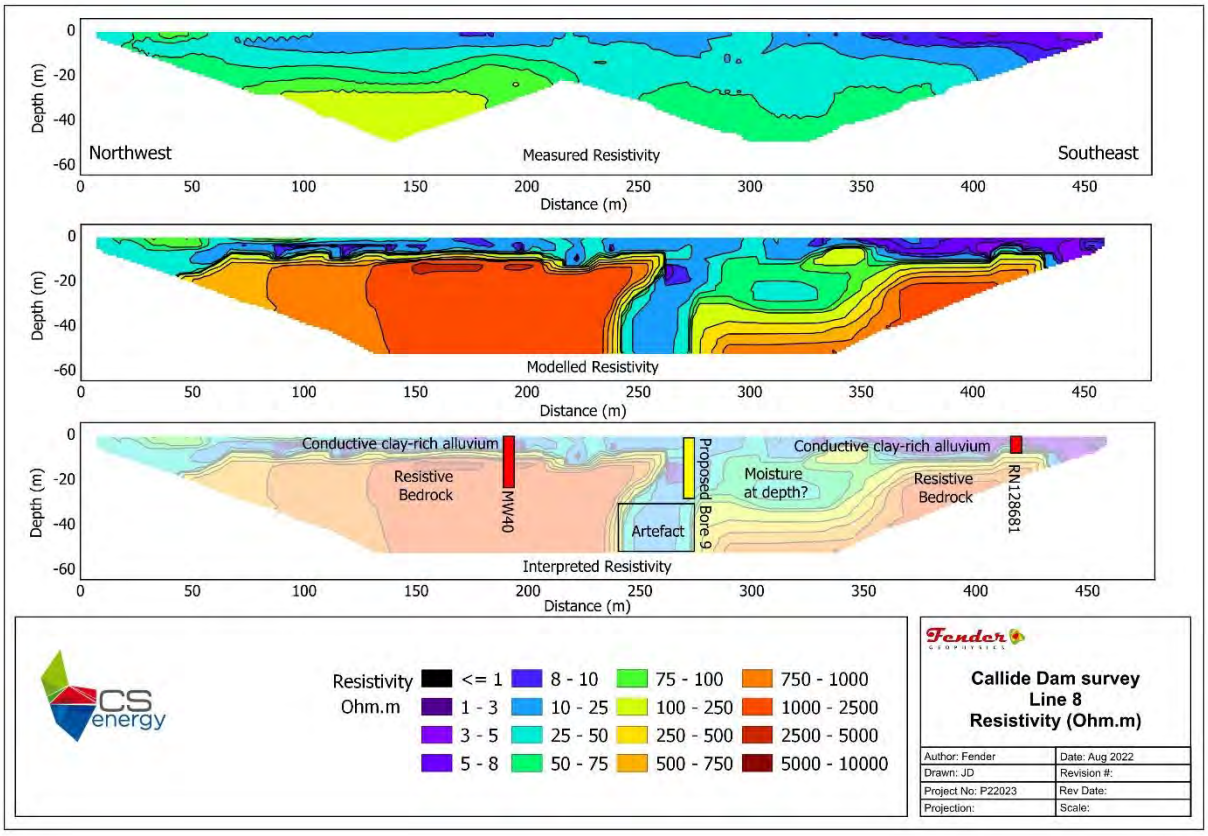


Figure 28. Resistivity and interpretation for Line 8

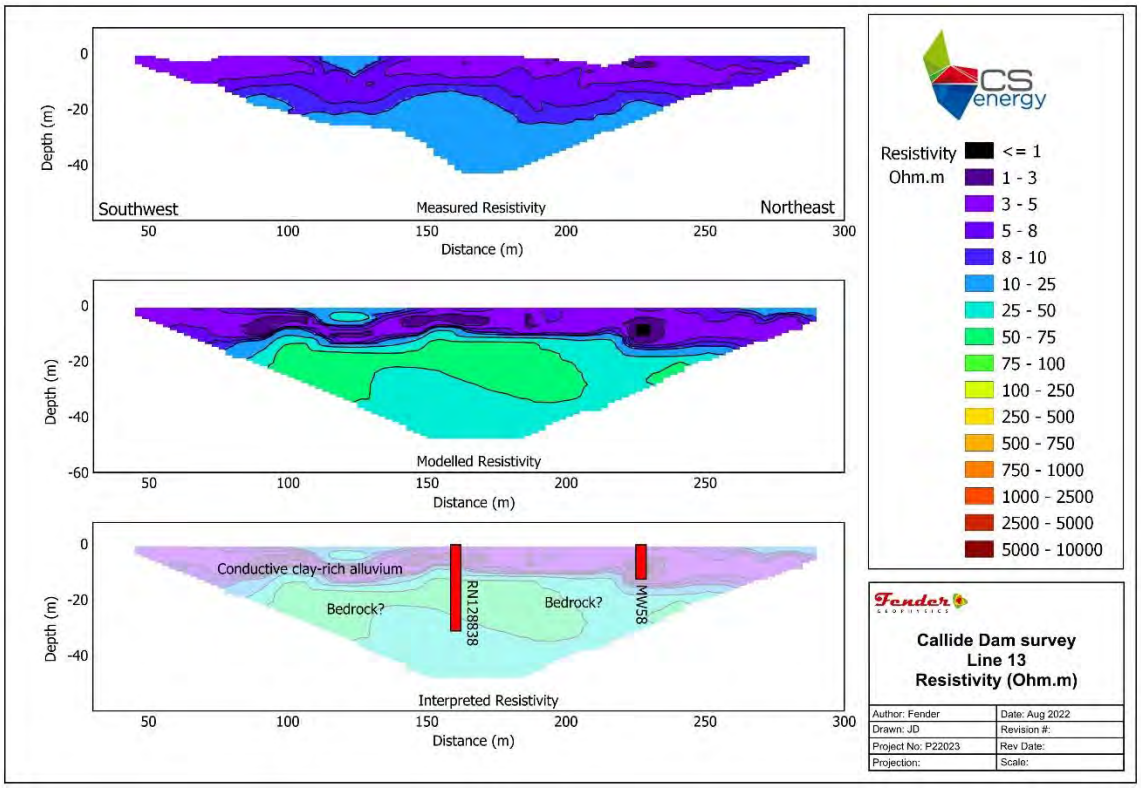


Figure 29. Resistivity and interpretation for Line 13

4.6 South-eastern groundwater profiles

Three survey lines (Lines 1-3) were acquired for the south-eastern groundwater profiles (Figure 28). However, lines 2 and 3 were joined together to make a single line after it was decided to move the lines that were originally planned further north-east. Line 1, the northern line is ground-truthed by bores MW32 and MW33 (Figure 28). Line 2/3 is ground-truthed by bores MW43 and MW31, however, these two bores were found at up to 50m from the resistivity profiles and thus are considered to be a less reliable indicator of geology and groundwater.

Line 1 has a comparatively resistive, upper alluvium unit (Figure 30). Bedrock was observed outcropping along the profile and Bores MW32 and MW33 also indicate shallow bedrock occurring at 1 and 3m depth respectively. Bore MW32 indicates the presence of groundwater between 17-19m depth within moderately weathered bedrock.

Line 2-3 is similar to Line 1 in so far as its upper alluvium is comparatively resistive and outcropping bedrock occurred within the profile (Figure 31). Bore MW31 indicated the presence of groundwater from 1-14m depth and suggest that groundwater likely exists in the area.

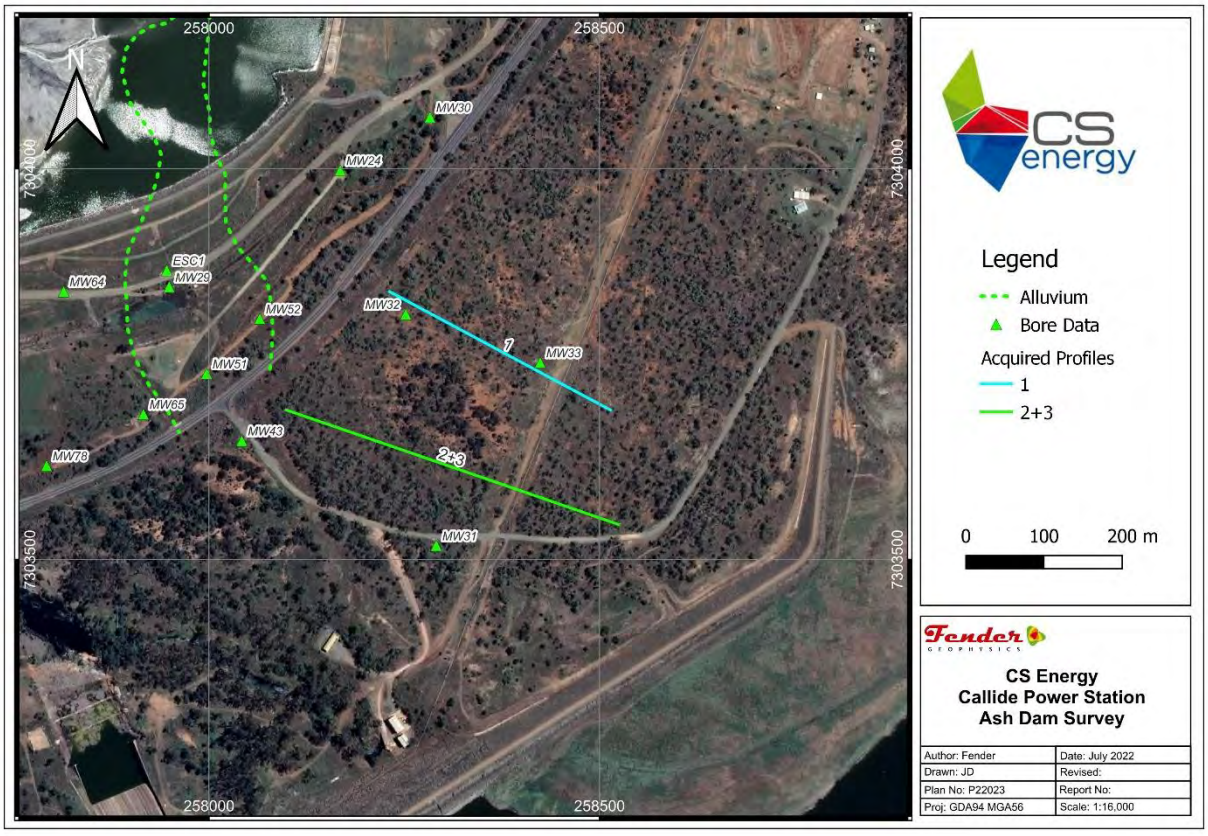


Figure 30. Geophysical survey lines and boreholes adjacent to the south-eastern groundwater bores.

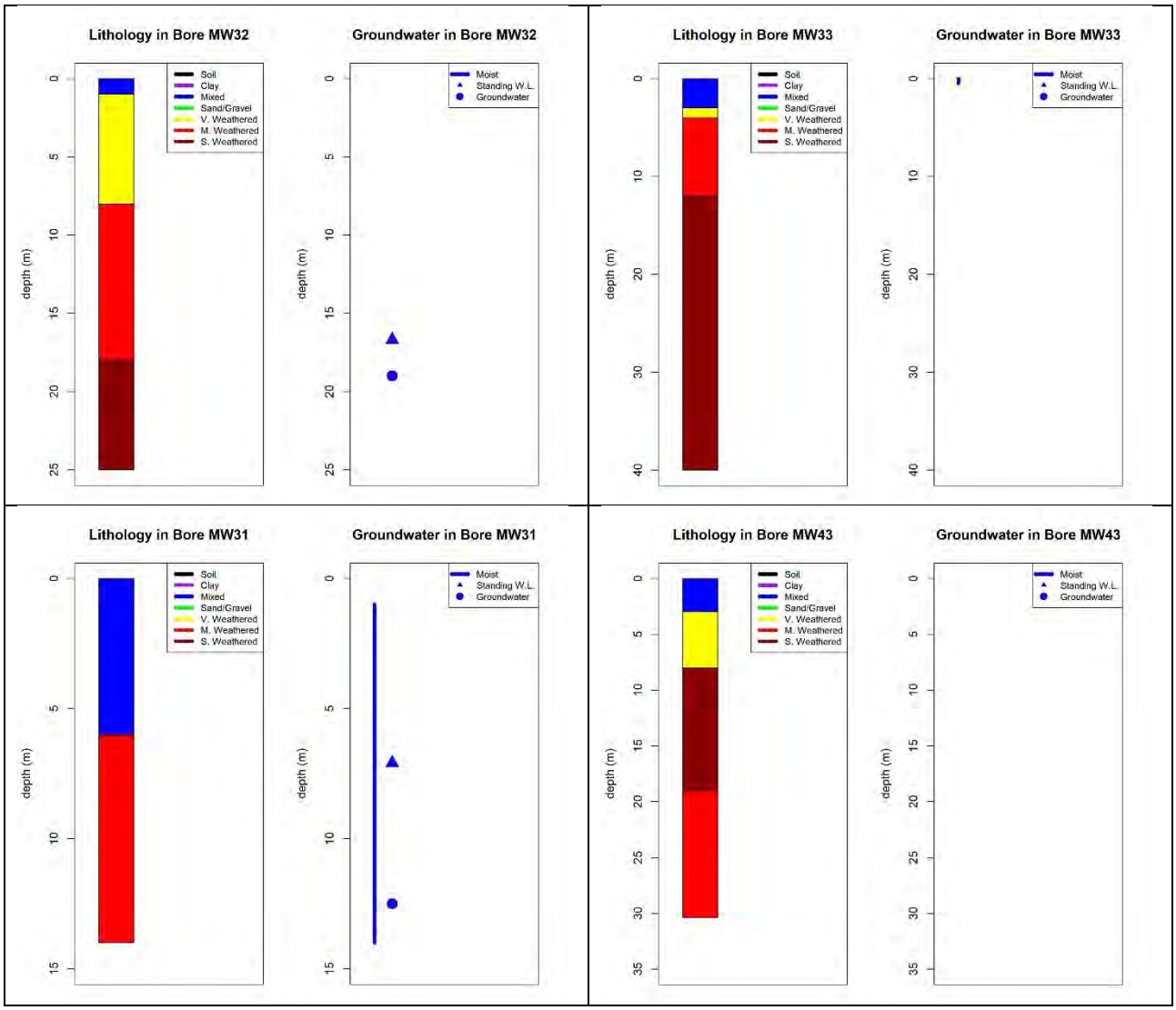


Figure 31. Borehole geology and groundwater indicators from the south-eastern groundwater bores

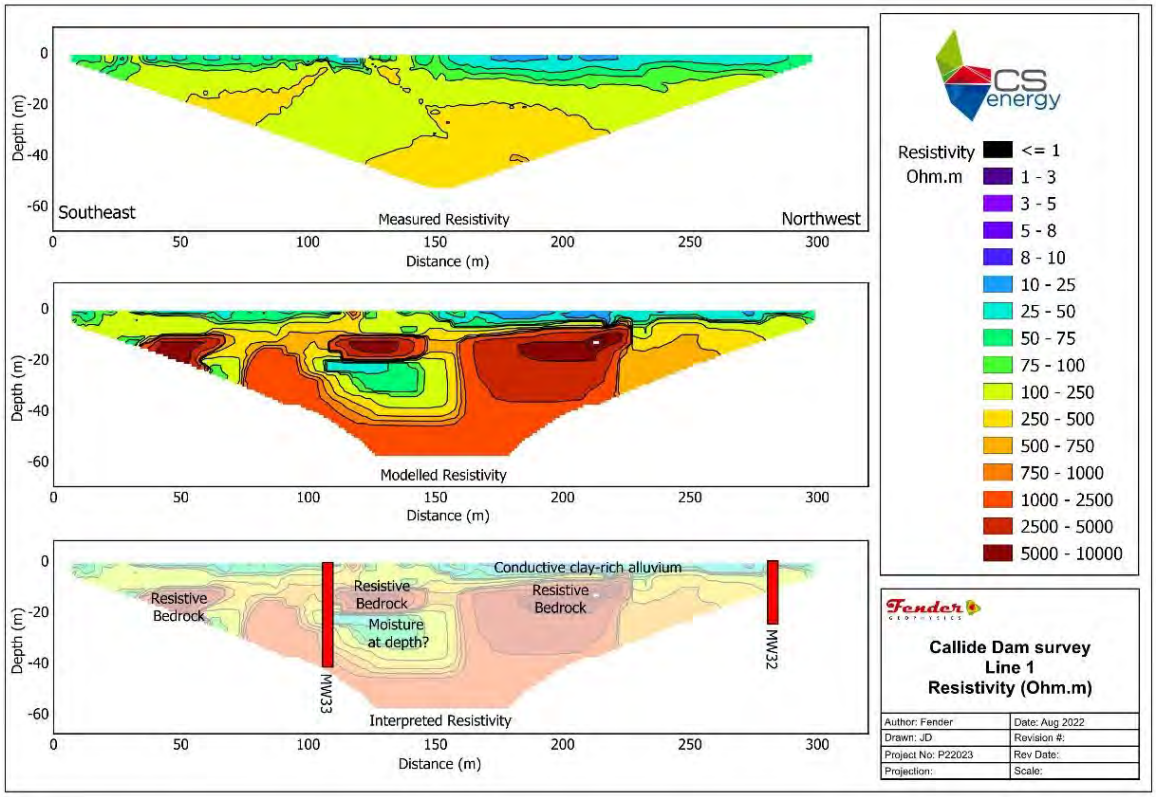


Figure 32. Resistivity and interpretation for Line 1.

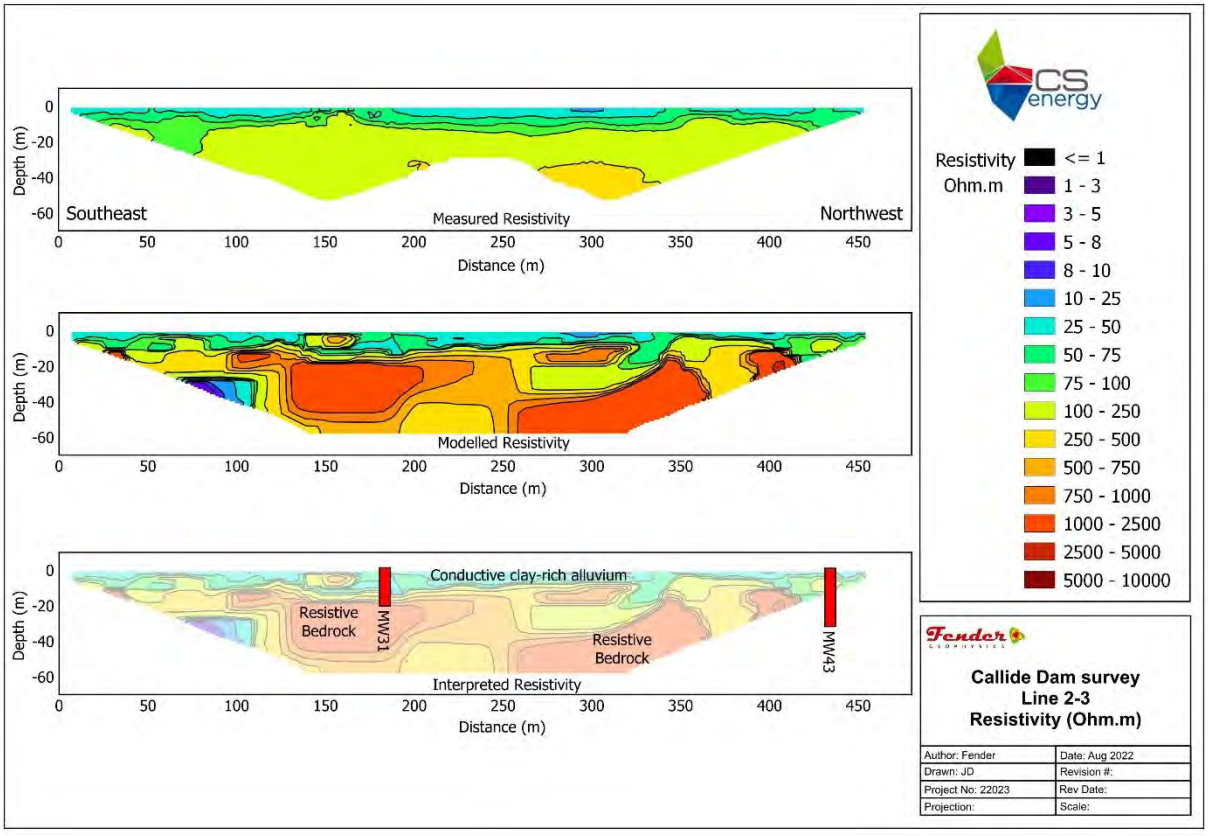


Figure 33. Resistivity and interpretation for Lines 2 and 3 (combined)

4.7 Borehole summary.

Five main geographic areas have been identified containing the proposed boreholes:

1. Eastern edge (Bores 1, 2, 4)
2. Southeast (Bore 3)
3. Southern margin (Bores 5-6)
4. Southwest corner (Bores 7-8)
5. West embankment (Bore 9)

For prioritising the 9 sites it is recommended to initially choose one from each area. Within the scope of the 9 bores, borehole 1 is considered a high priority as it lies on or near to the inferred fault and would be a likely conduit for groundwater. Although there are three proposed bores in that area the fault is a potential conduit and a gap in the well coverage that should be investigated. Bores 2 and 4 are considered secondary but should be re-evaluated depending on the result from bore 1.

Bore 9 is considered a 'gap-filler' but it does have a significant spread of low resistivity in its vicinity and does not have a monitoring well anywhere near it. It is worth investigating, but its priority could be decided on whether CS Energy prefers to focus on areas of known/suspected seepage or wanted to identify a new area of seepage that is potentially risky. The client could discount Bore 9 early in the prioritising process if it was considered too risky or costly.

From the southern margin bores 5 and 6 consist of similar targets. Bore 5 is approximately 50m from bore MW53 which shows presence of fractures rock, moisture and groundwater show at approximately 18m and could be considered a less risky target based on the data from bore MW53

From the southwest corner bores 7 and 8 also consist of similar targets. Existing bores close to proposed bores 7 and 8 (MW49 and MW40) have groundwater shows and moderately weather/fractured bedrock. However, there is little to differentiate the two sites.

All bores should be drilled to at least 30m depth.

Table 6. Proposed locations of boreholes (GDA2020 - MGA56)

Site No.	Easting	Northing	Area
1	258316 m E	7304140 m N	Eastern Edge
2	258240 m E	7304067 m N	Eastern Edge
3	258017 m E	7303883 m N	Eastern Edge
4	258385 m E	7304158 m N	Southeast
5	257338 m E	7303547 m N	Southern Margin
6	257223 m E	7303527 m N	Southern Margin
7	256919 m E	7303498 m N	Southwest Corner
8	256873 m E	7303641 m N	Southwest Corner
9	256421 m E	7303879 m N	Western Embankment

5.0 Project Summary

Over nine survey days, 41 resistivity profiles were acquired in the vicinity of the Callide Power Station Ash Dam B. Where possible, the resistivity data was interpreted using adjacent boreholes. Boreholes close to the resistivity profiles were chosen for the interpretation though in some instances there are 10's of meters separating the bore from the resistivity data. The resistivity response of the subsurface is a complex response that results from a combination of rock mineralogy, weathering, presence of water and salts, and the composition of the soil and alluvium. Key results from the survey were:

1. Over the entire field area the resistivity response can be broken down into two main units.
2. The upper unit is highly conductive. This is likely a result of the presence of moisture but also the presence of clay which is reported extensively within the alluvium. The upper unit is laterally extensive in some areas like the western margin of the Callide Dam property (lines 6+7) but is discontinuous elsewhere. This upper unit also likely contains weathered rock in places.
3. The lower unit consists of bedrock and is frequently sub-parallel to land surface. In places the bedrock unit is discontinuous and suggests the presence of conductive groundwater. The bedrock in the field area is frequently reported as weathered and/or fractured suggesting that it possesses the capacity to hold groundwater.
4. Borehole data shows that the upper rock units are commonly highly weathered or fractured and may act as a 'gradational' boundary between the alluvium and hard rock within the resistivity data.
5. Borehole data indicates that groundwater is most frequently observed in the upper alluvium and weathered bedrock. However, it is observed in select locations within rock where it is sufficiently weathered or fractured.
6. Bedrock was only seen outcropping in the south-eastern groundwater sites but is found close to the land surface in places (as indicated by boreholes). The shallow rock appears to contribute to the comparatively thin and resistive nature of the alluvium in some areas.
7. Nine borehole locations have been identified for possible drilling to assist with site remediation.

6.0 DELIVERABLES

The following deliverables were provided following project completion:

- Factual report (this document)
- Raw field data in ZZgeo format
- Processed field data (*.dat) and inversion results (*.xyz) in Res2Dinv format
- Resistivity profiles in jpg and pdf format
- GIS files for line locations (*.shp)
- Table of borehole locations

APPENDIX O GHD BORE INSTALLATION AND SAMPLING REPORTS (GHD, 2023)

Factual Bore Completion Report

Callide Groundwater Bore Drilling Project

CS Energy Limited

06 October 2023

→ **The Power of Commitment**



Project name		Callide Power Station PFAS Groundwater Bore Drilling Project					
Document title		Factual Bore Completion Report | Callide Groundwater Bore Drilling Project					
Project number		12609270					
File name		12609270-REP Drilling and bore installation report.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
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S4	0	M Prskalo	A Thomas		A Thomas		06/10/2023

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Contents

Abbreviations and acronyms **1**

1 Introduction **3**

1.1 Project background 3

1.2 Report purpose 4

1.3 Scope and limitations 4

1.4 Assumptions and qualifications 5

2 Fieldwork program **6**

2.1 Fieldwork schedule 6

2.2 Pre-work tasks 6

2.2.1 Program scheduling 6

2.2.2 Inductions and training 6

2.2.3 Subcontractors 7

2.2.4 Site visit and service location 7

2.2.5 Sampling and drilling plans 8

2.2.6 HSE documentation preparation 8

2.2.7 Environmental management plan 8

2.2.8 Works in a road corridor 8

2.2.9 Permitting 8

3 Bore drilling program **9**

3.1 Approach 9

3.2 Construction of drill pits and waste management 12

3.3 Borehole drilling 13

3.3.1 Soil and drilling chip sampling 13

3.3.2 Ground conditions encountered 13

3.4 Bore installation 14

3.4.1 Recovery bores 15

3.4.2 Monitoring bores 17

3.5 Bore development 20

3.6 Survey 20

4 Aquifer testing **21**

4.1 Slug testing 21

4.1.1 Method 21

4.1.2 Results 21

4.2 Pumping testing 22

4.2.1 Approach 22

4.2.2 Summary of testing completed 24

4.2.3 Results 25

5 Conclusions **28**

6 References **29**

Table index

Table 1.1	Summary of the program of works completed at the project site from 2019 to 2023.	3
Table 2.1	Timeline of the fieldworks	6
Table 2.2	Details of bore relocation and modifications to program	7
Table 3.1	Summary of newly installed recovery and monitoring bores	10
Table 3.2	Summary of ground conditions	14
Table 3.3	Summary of recovery bore construction information	16
Table 3.4	Summary of monitoring bore construction details	18
Table 3.5	Development records and airlifting yields	20
Table 4.1	Slug test details and results	21
Table 4.2	Pumping test summary	24

Figure index

Figure 3.1	Groundwater bore locations	11
Figure 3.2	Example of a typical lined pit	12
Figure 4.1	General pumping test setup (location MW90)	22
Figure D.1	Bore MW81 chip samples	
Figure D.2	Bore MW82 chip samples	
Figure D.3	Bore MW83 chip samples	
Figure D.4	Bore MW84 chip samples	
Figure D.5	Bore MW85 chip samples	
Figure D.6	Bore MW86 chip samples	
Figure D.7	Bore MW89 chip samples	
Figure D.8	Bore MW90 chip samples	
Figure D.9	Bore MW91 chip samples	
Figure D.10	Bore MW94 chip samples	
Figure D.11	Bore MW93 chip samples	
Figure I.1	Aquifer response to pumping – Bore MW81 constant rate pumping test	
Figure I.2	Field water quality during bore MW81 constant rate pumping test	
Figure I.3	Aquifer response to pumping – Bore MW82 constant rate pumping test	
Figure I.4	Field water quality during bore MW82 step drawdown pumping test	
Figure I.5	Aquifer response to pumping – Bore MW82 strep drawdown pumping test	
Figure I.6	Aquifer response to pumping – Bore MW83 constant rate pumping test	
Figure I.7	Field water quality during bore MW83 constant rate pumping test	
Figure I.8	Aquifer response to pumping – Bore MW85 constant rate pumping test	
Figure I.9	Aquifer response to pumping – Bore MW90 step drawdown pumping test	
Figure I.10	Aquifer response to pumping – Bore MW90 constant rate pumping test	

Appendices

Appendix A	Services clearance report
Appendix B	Waste tracking records
Appendix C	EPS pit rehabilitation report
Appendix D	Bore logs, chip samples, and ITP records
Appendix E	Photographic log
Appendix F	Bore development records
Appendix G	Bore survey results
Appendix H	Slug testing analysis
Appendix I	Pumping test analysis
Appendix J	Monitoring bore maintenance program

Abbreviations and acronyms

Term	Definition
AFFF	Aqueous Film Forming Foam
AH	Air Hammer
AHD	Australian Height Datum
ALS	ALS Australia Pty Ltd
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended in 2013
BGL	Below ground level
BN	Bentonite
BSC	Banana Shire Council
BTOC	Below top of casing
BYDA	Before You Dig Australia
CLID	Contaminated land investigation document
COC	Chain of Custody
CSE	CS Energy Limited
DES	Department of Environment and Science
DN	Diameter Nominal
DO	Dissolved oxygen
EC	Electrical conductivity
EE	Environmental Evaluation
EMP	Environmental Management Plan
EPS	Enviropacific Services
ERI	Electromagnetic Resistivity Imaging
FP	Filter Pack
GDA94	Geocentric Datum of Australia 1994
GHD	GHD Pty Ltd
JSEA	Job Safety and Environment Analysis
K	Hydraulic conductivity
HDPE	High Density Polyethylene
HSE	Health, Safety, and Environment
ID	Internal Diameter
ITP	Inspection and Testing Plan
ITT	Invitation to Tender
MGA	Map Grid of Australia
NATA	National Association of Testing Authorities
ORP	Oxidation-reduction potential
PFAS	Per- and poly-fluoroalkyl substances
PVC	Polyvinyl chloride

Term	Definition
QA/QC	Quality Assurance / Quality Control
RL	Reduced Level
SAQP	Sampling, Analysis and Quality Plan
SPC	Specific conductance
SWL	Standing water level
SWJ	Solvent Weld Joint
SWMS	Safe Work Method Statements
TDS	Total dissolved solids
ToC	Top of casing
TOPA	Total oxidisable precursor assay

1 Introduction

1.1 Project background

CS Energy Limited (CSE) has undertaken a series of investigative works at Callide Power Station (the 'Project site') to investigate potential impacts and risks associated with the historical use of Aqueous Film Forming Foam (AFFF) at the site. The preliminary investigations were triggered by the Queensland Government's implementation of the *Environmental Management of Firefighting Foam Operational Policy* issued in July 2016. The policy provided information on the requirements for a three-year transition period to fluorine-free foams, or alternative foams containing at least 99.5% shorter-chain per- and poly-fluoroalkyl substances (PFAS).

Subsequent investigations were commissioned by CSE in response to the Department of Environment and Science (DES) notice to conduct an Environmental Evaluation (EE) (Reference: EPPR00536313 | CCPLRC-100046232, most currently dated 21 August 2023) requiring CSE to investigate and assess the source, cause, and extent of any actual or potential environmental harm resulting from the historical use of AFFF on site.

Table 1.1 outlines the program of works completed by CSE, from 2019 to date and the scope of works that GHD Pty Ltd (GHD) completed as part of the *Callide Groundwater Bore Drilling Project*, which included delivery of a drilling and bore installation program at CSE's Callide Power Station located near Biloela, in Central Queensland.

Table 1.1 Summary of the program of works completed at the project site from 2019 to 2023.

Program of work	Description	Year	Performed by
Preliminary investigation works	Sampling results from the Callide Power Station indicated that onsite groundwater, surface water, soils and sediments contained varying levels of PFAS contamination.	2019	CSE
Sampling and geophysical investigation	– Investigations identified groundwater seepage along the southern site boundary containing elevated concentrations of PFAS. – Electromagnetic Resistivity Imaging (ERI) survey investigations were completed which identified potential water-bearing zones along the site boundary. – ERI output was used to inform selection of possible drilling locations. Nine borehole locations were recommended by the geophysicist..	2021-2022	CSE
Groundwater bore drilling and installation works (ITT No. 491855)	– Drilling and installation of five recovery bores – Drilling and installation of six monitoring bores – Development of all 11 newly installed bores – Conducting pumping tests on five newly installed recovery bores and slug testing of five monitoring bores (one was dry) – Groundwater sampling and analysis of five new recovery bores, five new monitoring bores, and one existing monitoring bore. One new monitoring bore was not sampled as it was dry. – Soil and drill cuttings sampling and analysis. – Reporting (this report)	2023	GHD

CSE prepared a scope of work to undertake a targeted drilling and bore installation program to fulfill the requirements of the EE and to further characterise the potential source and extent of PFAS contamination likely to be caused from the storage and use of AFFF at the premises.

GHD were engaged to undertake the drilling, bore installation, and testing program. The *Callide Groundwater Bore Drilling Project* included the following tasks:

– Drilling and installation of five (5 No.) recovery bores and six (6 No.) monitoring bores
– Soil and drill cuttings sampling and analysis
– Pumping tests on the 5 No. recovery bores

– Groundwater sampling of newly installed bores plus one existing bore, i.e., five new recovery bores, five new monitoring bores (one new monitoring bore was not sampled as it was dry), and one existing monitoring bore
– Survey of newly installed bores
– Reporting

The details of the field program are outlined in this report, titled *Factual Bore Completion Report*.

1.2 Report purpose

The purpose of this report is to provide an outline of the methodology and summarise the results of the drilling and bore testing of 11 No. groundwater bores (5 No. recovery and 6 No. monitoring).

The report presents factual data collected and observations made during the field program, including services clearance confirmation, earthworks completed for drill pits, locations of recovery bores and monitoring bores, borehole drill and installation logs, bore development details, drill cutting and water disposal management details, bore survey details, slug testing analysis results, and pumping testing analysis results. The soil/solid sampling and groundwater sampling methodologies and results are reported in separate reports, *Soil Sampling Report* (GHD 2023b) and *Groundwater Sampling Report* (GHD 2023c), respectively.

1.3 Scope and limitations

This report is subject to the limitations set out below and must be read in conjunction with each of the supporting technical reports summarised in Section 1.2, as well as the assumptions, exclusions, and qualifications within the supporting technical reports.

This report has been prepared by GHD Pty Ltd (GHD) for CS Energy Limited (CSE) for the purpose of responding to a notice to conduct an environmental evaluation issued by the administering authority pursuant to section 326B of the *Environmental Protection Act 1994* (Qld) (EP Act) (the Purpose), and not for any other purpose. The report may be used by Queensland Department of Environment and Science (DES), acting in its capacity as the administering authority (as defined in the EP Act)), and the appointed contaminated land auditor, and Luke Amies (Suitably Qualified Person) for the Purpose. GHD disclaims responsibility and liability to any person other than CSE arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally possible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

While every effort has been made by GHD to assess contamination as required by the scope of services, GHD cannot, guarantee that other issues outside of the scope of services do not remain.

GHD has prepared this report on the basis of information provided by CSE and others who provided information to GHD (including Government authorities and analytical laboratories), which GHD has not independently verified or checked beyond the agreed scope of work. Where drill hole logs, laboratory tests and similar work have been performed and recorded by others the data is included and used in the form provided by others. The responsibility for the accuracy of such data remains with the issuing authority, not with GHD. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described throughout this report. GHD disclaims liability arising from any of the assumptions being incorrect. The opinions, conclusions and any recommendations in this report are based on information obtained from site inspections and sample collection at discrete locations across the site and may not fully represent the conditions that may be encountered across the site at other than these locations. It is emphasised that the actual characteristics of the sub-surface and surface materials may vary significantly between adjacent test points and sample intervals and at locations other than where observations, explorations and investigations have been made. Sub-surface conditions, including groundwater levels and contaminant concentrations can change in a limited time. This should be borne in mind when assessing the data. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date the report was prepared.

It should be noted that because of the inherent uncertainties in the sub-surface evaluations, changed or unanticipated sub-surface conditions may occur that could affect the opinions GHD has expressed, which may need to be re-examined and changed. GHD does not accept responsibility for the consequences of significant variations in the conditions.

An understanding of the site conditions depends on the integration of many pieces of information, some regional, some site specific, some structure-specific and some experienced based. Hence, this report must be read in full and should not be altered, amended, or abbreviated, issued in part, or issued incomplete in any way without prior checking and approval by GHD.

GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date the report was prepared.

1.4 Assumptions and qualifications

Assumptions and qualifications for the Callide Groundwater Bore Drilling Project drilling and installation program include:

– Observations recorded were based on the conditions (including subsurface conditions) that existed at the time of the fieldwork.
– Locations and target depths for the recovery and groundwater bores were selected by CSE in advance. Where site constraints and access issues required changes to proposed locations, the amended locations were agreed between CSE and GHD. Further details of any bore location changes are detailed later in this report.
– As advised by the client, determination of the final drilled and bore installation depths were made in consultation with the CSE site hydrogeologist.

2 Fieldwork program

2.1 Fieldwork schedule

A timeline of the tasks completed during the fieldwork program is provided in Table 2.1.

Table 2.1 Timeline of the fieldworks

Activity	Dates
Site visit and services clearance	21 June 2023
Construction of drilling pits	Monday 10 July to Tuesday 11 July 2023
Drilling and bore installation, including bore development	Monday 10 July to Friday 28 July 2023
Pumping tests of 5 No recovery bores, slug tests on 5 No. monitoring bores	Tuesday 1 August to Friday 11 August 2023
Rehabilitation of drilling pits	Progressive rehabilitation during fieldwork program, completed Monday 14 August 2023
Groundwater sampling of seven monitoring bores	Monday 14 August to Tuesday 15 August 2023
Survey of bores	Thursday 3 August 2023 and Wednesday 16 August 2023

2.2 Pre-work tasks

There were several pre-mobilisation tasks that were completed prior to commencement of the fieldwork program, including:

– Project kick-off meeting
– Program scheduling
– Inductions and training
– Engagement of GHD subcontractors
– Site inspection
– Services clearance
– Preparation of Health, Safety and Environment (HSE) Plan, including JSEA
– Preparation of Environmental Management Plan (EMP)
– Sampling and Drilling Plan
– Permits and site access

2.2.1 Program scheduling

Upon award of the project, a project kick-off meeting was held (via teleconference) to discuss the project schedule, site access requirements, approvals and permitting requirements (e.g., traffic control, permits), site visit arrangements, HSE systems familiarisation, induction and training requirements, HSE documentation requirements, and confirmation on deliverables and timing.

Following the meeting, GHD prepared a delivery schedule for approval by CSE. The schedule outlined the proposed drilling program sequence and timing, as well as preparation and delivery of reports.

Weekly progress meetings were held and attended by GHD and CSE to discuss project progress, issues, incidents and progress of assigned actions.

2.2.2 Inductions and training

All GHD and subcontractor field personnel completed the CSE site inductions (e.g., online site induction, waste containment facility induction) and site access forms. GHD personnel also had other required competencies (e.g.,

first aid, etc.). Additionally, the supervising hydrogeologist had G1G8G9 (Mining Supervisor) and G2 (Carry out the Risk Management Processes) qualifications.

2.2.3 Subcontractors

GHD utilised the services of our experienced subcontractors (who are pre-qualified in GHD's system) to deliver the program, as follows:

– Services location: GeoRadar Australia
– Drilling Contractor: JAB Drilling
– Earthworks and waste management: Enviropacific Services (EPS)
– Surveyor: Fredriksen, MacLean & Associates
– Pumping test contractor: Gierke Pumps & Irrigation
– Groundwater and soil sample analysis: ALS (primary) / Eurofins (secondary)

2.2.4 Site visit and service location

Prior to drilling commencement, a site visit was undertaken on 21 June 2023, attended by representatives from CSE, GHD, JAB Drilling, and EPS to establish an understanding of the site and review the proposed locations' accessibility for the planned drilling works.

An accredited service locator (GeoRadar Australia) also attended the site visit to undertake utility clearance of the proposed 14 No. drilling locations, using an electro-magnetic induction scanner and 2D ground penetrating radar, with reference to Before You Dig Australia (BYDA) and other available service plans as provided by CSE. The services clearance report is included in Appendix A.

As a result of the site inspection, one proposed offsite borehole location (MW93) was relocated to onsite and renamed to MW98 and others relocated to more accessible locations, as detailed below in Table 2.2.

Table 2.2 Details of bore relocation and modifications to program

Bore ID	Constraint	Details of relocation
MW93	Cannot access proposed location. Vegetation too dense and terrain too rough.	Bore relocated to onsite location and re-labelled as MW98.
MW83	Location is next to the Eastern Seepage Drain, too steep and not enough room between the road and the drain.	Relocated to the northern side of the road at the base of the embankment for the Ash Dam.
MW87	Located on Powerlink Queensland owned land. No access to site	Borehole not drilled due to no access to property. Bore to be potentially relocated and drilled at later date. Relocation to be confirmed
MW88	Located on Powerlink Queensland owned land. No access to site	Borehole not drilled due to no access to property. Bore to be potentially relocated and drilled at later date. Relocation to be confirmed
MW92	Located on Powerlink Queensland owned land. No access to site	Borehole not drilled due to no access to property. Bore to be potentially relocated and drilled at later date. Relocation to be confirmed

The final locations of the newly installed bores are shown on Figure 3.1.

2.2.5 Sampling and drilling plans

In consultation with CSE, GHD prepared a sampling, analysis and quality plan (SAQP) for the scope of work, inclusive of a drilling plan, to outline the project objectives, fieldwork methodology, sampling schedule, analytical schedule, and quality assurance and quality control (QA/QC) procedures.

The QA/QC procedures were based on NEPC (2013) measures and PFAS NEMP 2.0 (HEPA 2020). QA involves all the actions, procedures, checks and decisions undertaken to ensure the representativeness and integrity of samples and accuracy and reliability of analytical results (ASC NEPM). QC involves protocols to monitor and measure the effectiveness of QA procedures.

The drilling plan included details for the drilling work including specification for the construction of both the recovery and monitoring bores. The drilling plan included an Inspection and Testing Plan (ITP) template for approval by CSE.

2.2.6 HSE documentation preparation

Fieldwork preparation included a project-specific risk assessment and hazard management program, documented in a HSE Plan, which was provided to CSE for approval prior to site mobilisation.

The HSE Plan identified foreseeable hazards associated with site works, and addressed how the hazards were to be managed using a risk assessment framework. The HSE Plan defined the processes for site safety, required inductions, procedure for emergencies, procedure for incident reporting, vehicle and equipment inspections, management of chemical, journey management and check-in procedures. The HSE Plan also included a project-specific Job Safety and Environment Analysis (JSEA) and Pre-Work Assessments, synonymous with safe work method statements (SWMS) to ensure GHD and subcontractor personnel adhered to the pre-qualification checks commensurate with the works to be performed. Refer to Section 3 for a detailed outline of the HSE system that was implemented on this project.

The field team retained all safety documentation (JSEA, pre-work assessments, registers, records, forms), which were filed at the end of the fieldwork program.

2.2.7 Environmental management plan

An Environmental Management Plan (EMP) was prepared for the project. The EMP was submitted to CSE for approval prior to mobilisation.

2.2.8 Works in a road corridor

Following receipt of tender clarification responses from CSE (received 4 April 2023), GHD understood that the proposed monitoring bores MW89 and MW91 and recovery bore MW90 were located in a road parcel (Cocups Rd parcel).

CSE consulted with Banana Shire Council (BSC) and it was determined that a road works approvals / permit and traffic management plan was not required prior to undertaking any drilling works. However, for the safety of the personnel working at location MW91, traffic controllers were engaged through EPS to manage the traffic during the pit construction, drilling, bore installation and development, headworks construction, emptying of pit and rehabilitation of pit. Work on bore MW91 was fully completed within two days to ensure minimal disruption to road users.

2.2.9 Permitting

All earthworks, drilling and bore installation, and pumping test work within the CSE site were completed under a CSE Permit to Work. All work within offsite locations was completed under GHD supervision utilising GHD's HSE management system.

3 Bore drilling program

3.1 Approach

The following section describes the tasks and methodologies undertaken during the fieldwork program for the following activities:

– Drilling pit construction and waste management
– Borehole drilling
– Soil/solid and drilling waste sampling
– Bore installation
– Bore development
– Survey

Table 3.1 provides a summary of bore locations and construction details for the 11 No. newly installed recovery and monitoring bores. This table provides information on the bore type, screen depths, screened geology of the adjacent strata and bore survey data. Figure 3.1 shows the location of the new recovery and monitoring bores.

Table 3.1 Summary of newly installed recovery and monitoring bores

Location area	Bore ID	Bore type	Screened aquifer unit	GDA94 MGA Zone 56		Natural surface elevation (m AHD)	Elevation of top of casing (m AHD)	Drilled depth (m BGL)	Screen interval (m BGL)	Date installed
				Easting	Northing					
Lower Ring Road	MW81	Recovery	Breccia / Tuff	258295.466	7304124.687	209.707	210.192	25.0	16.0 – 22.0	12/07/2023
Lower Ring Road	MW82	Recovery	Andesite	258241.432	7304075.328	208.495	209.023	25.0	18.0 – 24.0	13/07/2023
Lower Ring Road	MW83	Recovery	Andesite	257998.064	7303887.720	197.698	198.210	37.0	17.0 – 23.0	14/07/2023
Fire track	MW84	Monitoring	Andesite	258370.406	7304141.737	212.598	213.278	40.0	12.0 – 18.0	11/07/2023
Fire track	MW85	Recovery	Andesite	258045.167	7303790.073	196.261	196.984	40.0	9.5 – 15.5	19/07/2023
Fire track	MW86	Monitoring	Andesite	257074.299	7303520.495	197.514	198.203	37.0	9.0 – 15.0	18/07/2023
Offsite	MW89	Monitoring	Shale	258023.937	7303642.861	191.542	192.203	12.5	5.0 – 11.0	21/07/2023
Offsite	MW90	Recovery	Shale	258012.324	7303617.432	190.482	191.097	31.0	21.0 – 27.0	27/07/2023
Offsite	MW91	Monitoring	Andesite	258097.269	7303613.698	193.046	193.772	30.0	12.1 – 18.1	26/07/2023
Fire track	MW94	Monitoring	Andesite / Tuff / Shale	257792.558	7303623.283	193.811	194.311	25.0	19.0 – 25.0	15/07/2023
Fire track	MW98	Monitoring	Shale	256822.495	7303493.653	189.422	190.004	31.0	12.0 – 18.0	18/07/2023

Table notes:

Easting, Northing and elevations listed are from survey completed by Fredriksen, Maclean and Associates.

AHD – Australian Height Datum

BGL – Below ground level

GDA – Geodetic Datum of Australia

MGA – Map Grid of Australia



Paper Size ISO A3

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

CS Energy Limited
Factual Bore Completion Report

Groundwater bore locations

Project No. **12609270**
Revision No. **A**
Date **03/10/2023**

FIGURE 3.1

\\ghdnet\GHD\AU\Brisbane\Projects\41\12609270\GIS\Maps\12609270_CallidePowerStation.aprx - 12609270_001_GroundwaterSampling
Print date: 03 Oct 2023 - 10:14

Data source: Basemaps_LatestStateProgram_AllUsers: . DoR: roads (2021), watercourse (2022), cadastre (2023); GHD: sample locations (2023). Created by: thunt2

3.2 Construction of drill pits and waste management

Due to the potential for drill cuttings and water produced during drilling being classified as a regulated waste (due to the presence of PFAS), all drill cuttings and water produced during the drilling, construction, bore development, and testing work were captured and disposed of appropriately.

The generated drilling and bore development waste was managed by EPS. At each of the drill locations a HDPE-lined pit was constructed by EPS and their subcontractors. The typical pit arrangement is shown in Figure 3.2.

Management of the waste generally included:

– On site locations: vacuum excavation truck collected water and cuttings from the pits and disposed of the waste at the Eastern Seepage Collection Pond, located along the Lower Ring Road. The movement of the waste materials was tracked by the vacuum excavation truck operator.
– Offsite locations: cuttings, drill water, and bore development water was captured into the lined pits. A vacuum excavation truck emptied the water from the pits and into a 10,000 L storage tank that was situated within a fenced location near the offsite drilling locations. A sample of the fluid in the storage tank was submitted to ALS for analysis and EPS obtained acceptance from a regulated waste facility to accept the wastewater. A regulated waste vacuum excavation truck emptied the water tank and transported the regulated waste to Flat Filters (39375 Burnett Highway Thangool QLD 4716). The waste certificates were signed by a CSE representative.

The vacuum excavation truck logs, certified laboratory report of the water analysis, and some of the regulated waste transfer certificates are included in Appendix B. At the time of report preparation GHD were still awaiting copies for an additional two waste disposal certificates (i.e., disposal of groundwater sampling purge water and liner).



Figure 3.2 Example of a typical lined pit

At the end of the fieldwork program, the pits were rehabilitated by EPS. EPS prepared a rehabilitation report, with photos of the rehabilitated pits, included in Appendix C. Generally, the rehabilitation work included:

– The pit was emptied by the vacuum excavation truck of any remaining liquid. Wastewater from onsite pits was disposed to the Eastern Seepage Collection Pond, and wastewater from the offsite locations was collected by a regulated waste contractor and disposed to the licenced facility.
– Any remaining drill cuttings from the lined pits were temporarily stockpiled next to the pit.
– The liner was removed and stored temporarily at the laydown area. The liner was disposed by EPS to a licenced facility that accepts PFAS regulated waste.
– The open pit was filled with the drill cuttings and then the excavated material that was stockpiled near the pit, compacted, and levelled.

3.3 Borehole drilling

The drilling services were provided by JAB Drilling, with Tony Watkinson as the lead, licenced water bore driller. Onsite hydrogeological support was provided by an experienced hydrogeologist from GHD. The drilling works occurred over a three-week period.

A total of 5 No. recovery bores and six monitoring bores were drilled and installed within the CSE controlled area, and within a road reserve. Three (3) of the proposed monitoring bores were not drilled and installed (no access to property) and will be completed as part of a separate scope of work.

The boreholes were drilled using a conventional truck mounted drill rig (Investigator MK-10) with rotary air capabilities and rated beyond 100 m. Rotary air was used as the preferred method to be able to identify water strike and potential groundwater ingress and outflow features. Initially boreholes were advanced with a hand auger to confirm clearances from underground services and obtain shallow soil samples. Boreholes were subsequently completed using a blade bit through residual soils and weak saprolite, before switching to pneumatic downhole hammer in competent rock. Drill bit sizes were 100 mm and 205 mm for monitoring and recovery bores respectively.

Drill cuttings were collected every 1 m and placed into chip boxes or laid out on ground, and then photographed to provide a visual record (refer to Appendix D). The lithology of the chips was logged by the supervising hydrogeologist in accordance with Australian Standard AS1726:2017. Chips were disposed into the lined drill pit after logging and photographing were completed.

Decontamination of the drilling equipment (drill bit, stabiliser and rods that entered the borehole) was completed between each of the drilling locations which included using a pressure washer with deionised water to rinse the rods as they were tripped out of the borehole and washing the drill bit/s in a bucket of deionised water and a final deionised water rinse with a sprayer.

Details of the hydrogeological conditions encountered during drilling are provided in the borehole logs, included in Appendix D.

3.3.1 Soil and drilling chip sampling

During the drilling program samples were collected of shallow sub-surface soils, deeper sub-surface soils, drill cuttings, and cuttings from the water bearing unit at each drill location. The methodology of the soils/solids sampling and the laboratory analytical results are reported in the *Soil Sampling Report* (GHD 2023b).

3.3.2 Ground conditions encountered

Most of the chip samples logged indicated strata that was consistent with the geological descriptions for the Lochenbar Formation, as described in the Biloela 1:100,000 series geological mapping (DNRM, 2001). The Lochenbar Formation is a green-grey to purple andesitic breccia.

A summary of the groundwater conditions encountered during drilling are presented Table 3.2. Superficial materials (generally the upper 1 m to 5 m) were predominantly fine-grained, comprising variable mixtures of sandy and silty clay, and clay. Some shallow soils were either reworked residual soils, or possibly fill derived from local sources. The superficial materials were dry (unsaturated) and often included gravels and cobbles of andesite /

weathered rock. The competency of these materials increased with depth, such that blade bit refusal was achieved and the drilling method switched to downhole hammer.

Based on field observations of the drilling chips there are marked differences in the lithology between location MW81, MW82 and MW83, which are all located in relatively close proximity to each other. Observations from the drill chip samples (refer to chip photos in Appendix D) are summarised as follows:

– MW84: layers of purple andesite, grey-brown shale, purple andesite, and grey shale
– MW81: grey-green breccia / tuff
– MW82: grey-green and brown breccia, with underlying green-grey and purple-brown andesite, and grey shale

Given the variable lithological composition of the Lochenbar formation and the presence of inferred faulting in this area, it is not unusual to encounter different lithological layers in a small area.

Table 3.2 Summary of ground conditions

Bore ID	Water strike (m BGL)	Temporary borehole water level (m BGL)	Water-bearing zone depth range (m BGL)	Water-bearing zone lithology
MW81	12.0	8.57	12.0 – 25.0	Breccia / Tuff
MW82	8.5	8.6	18.4 – 23.8	Andesite
MW83	9.0	Not recorded	8.4 – 23.0	Andesite
MW84	11.0	5.6	11.0 – 18.0	Andesite
MW85	9.0	7.3	9.0 – 10.0	Andesite
MW86	Groundwater not encountered during drilling	NA	NA	NA
MW89	6.5 – 7.0	6.28	6.5 – 12.5	Shale
MW90	8.0	Not recorded	8.0 – 17.0 17.0 – 31.0	Andesite Shale
MW91	12.0	Not recorded	12.0 – 30.0	Andesite
MW94	19.0	Not recorded	19.0 – 20.0 20.0 – 20.8 20.8 – 25.0	Andesite Tuff Shale
MW98	Groundwater not encountered during drilling	NA	Uncertain	Shale
Notes: NA – Not available				

3.4 Bore installation

Based on the logged sample chips and interpretation of downhole conditions, and in consultation with the driller, a design for the bore was prepared by the supervising hydrogeologist. During drilling, specific attention was given to identifying water strikes and monitoring the flow rate as drilling continued to final investigation depth. This information was used in conjunction with the geological log and standing water level (SWL) to determine the interval to be screened.

The bore drilling, bore design, and installation were consistent with the NUDLC (2020) guidelines. The design and installation of each bore was subjected to the Inspection and Test Plan (ITP) approved by CSE, that documented and confirmed the installation was compliant with the guidelines.

Borehole logs of the installed bores, a photo of the chip samples, and the ITP forms are attached as Appendix D. Photographs of the completed bores are included in Appendix E.

3.4.1 Recovery bores

The following approach to recovery bore construction was undertaken and details provided in Table 3.3:

- Drilled at a diameter of 205 mm to install 150 mm (DN150) Class 9 PVC casing and a 6 m stainless steel screen with 1 mm aperture
- Washed and graded 5 mm filter pack was installed a minimum of 1 m above the slotted screen
- Bentonite seal a minimum of 1 m thick, was installed above the filter pack using 12.5 mm (0.5 inch) bentonite chips
- Top of filter pack and bentonite seal was measured to check installation depths
- Bentonite chips were allowed to hydrate prior to grouting to the ground surface
- Grout from bentonite seal to surface was installed with a 3% bentonite cement-grout mix
- Bores were completed with a surficial cement pad and lockable steel monument. Four 1.8 m star pickets were installed to provide a final installed height of 1.2 m to 1.5 m, painted yellow and fitted with plastic safety caps, installed at 1 m centres around each bore. Bore casing extended a minimum 0.4 m above ground level.

Table 3.3 Summary of recovery bore construction information

Bore ID	MW81	MW82	MW83	MW85	MW90
Location description	Lower Ring Road	Lower Ring Road	Lower Ring Road	Southern boundary fire track	Cocups Rd reserve
Start date	12/07/2023	13/07/2023	14/07/2023	19/07/2023	27/07/2023
Completed date	12/07/2023	13/07/2023	14/07/2023	19/07/2023	27/07/2023
Easting	258295.466	258241.432	257998.064	258045.167	258012.324
Northing	7304124.687	7304075.328	7303887.720	7303790.073	7303617.432
Total drilled depth (m BGL)	25.0	25.0	27.0	40.0	31.0
Drilled diameter (mm)	205	205	205	205	205
Backfill: Filter pack (FP)	FP: 22 – 25	FP: 24 – 25	FP: 23 – 37	FP: 15.5 – 40	FP 27 – 31
Casing type	Class 9 PVC SWJ	Class 9 PVC SWJ	Class 9 PVC SWJ	Class 9 PVC SWJ	Class 9 PVC SWJ
Casing diameter	DN150 (147 mm ID)	DN150 (147 mm ID)	DN150 (147 mm ID)	DN150 (147 mm ID)	DN150 (147 mm ID)
Casing stickup (m AGL)	0.474	0.519	0.499	0.712	0.636
Casing completion depth	22.0	24.0	23.0	15.5	27.0
Screen type	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Screen diameter	150 mm	150 mm	150 mm	150 mm	150 mm
Screen aperture	1 mm	1 mm	1 mm	1 mm	1 mm
Screen top	16.0	18.0	17.0	9.5	21.0
Screen base	22.0	24.0	23.0	15.5	27.0
Filter pack top	14.0	14.5	15.0	5.0	7.5
Filter pack base	16.0	18.0	17.0	9.5	21.0
Bentonite top	13.0	13.5	14.0	4.0	6.5
Bentonite base	14.0	14.5	15.0	5.0	7.5
Grout top	0.0	0.0	0.0	0.0	0.0
Grout base	13.0	13.5	14.0	4.0	6.5
Completion	Monument	Monument	Monument	Monument	Monument

Table notes: 1. Easting, northing, and stickup obtained from survey data. 2. Drilled and installation depths are metres below ground level (m BGL). 3. SWJ – solvent weld joint.

3.4.2 Monitoring bores

The following approach to monitoring bore construction was undertaken and details provided in Table 3.4:

- Drill 100 mm diameter bore to install 50 mm (DN50) Class 18 uPVC threaded casing.
- A 6 m screen comprising Class 18 uPVC machine slotted 0.5 mm aperture was installed.
- End cap was screwed in.
- Washed and graded 3 mm filter pack was installed a minimum of 1 m above the slotted casing for all monitoring bores.
- Bentonite seals of a minimum thickness of 1 m was installed above the filter pack using 12.5 mm (0.5 inch) bentonite chips.
- Bentonite chips were allowed to hydrate prior to grouting to the surface.
- The top of filter pack and of the bentonite seal was measured to check installation depths.
- Grout for the bores from the bentonite seal to surface was installed using a 3% bentonite cement-grout mix.
- Bores were completed with a surficial cement pad and lockable steel monument. Four 1.8 m star pickets were installed to provide a final installed height of 1.2 m to 1.5 m, painted yellow and fitted with plastic safety caps, installed at 1 m centres around each bore. Bore casing extended a minimum 0.4 m above ground level.

Table 3.4 Summary of monitoring bore construction details

Bore ID	MW84	MW86	MW89	MW91	MW94	MW98
Location description	Fire track off Lower Ring Rd	Southern fire track	Cocups Rd Reserve	Cocups Rd Reserve	Southern fire track	Southern fire track
Start date	11/07/2023	18/07/2023	21/07/2023	26/07/2023	15/07/2023	18/07/2023
Completed date	11/07/2023	18/07/2023	21/07/2023	26/07/2023	15/07/2023	18/07/2023
Easting	258370.406	257074.299	258023.937	258097.269	257792.558	256822.495
Northing	7304141.737	7303520.495	7303642.861	7303613.698	7303623.283	7303493.653
Total drilled depth (m BGL)	40.0	37.0	12.5	30.0	25.0	31.0
Drilled diameter (mm)	100	100	100	100	100	100
Backfill: Filter pack (FP) Bentonite (BN)	FP: 20 – 40 BN: 19 – 20 FP: 18 – 19	FP: 17 – 37 BN: 16 – 17 FP: 15 – 16	FP: 11 – 12.5	FP: 21 – 30 BN: 20 – 21 FP: 18.1 – 20	None	FP: 20 – 31 BN: 19 – 20 FP: 18 – 19
Casing type	Class 18 PVC TJ	Class 18 PVC TJ	Class 18 PVC TJ	Class 18 PVC TJ	Class 18 PVC TJ	Class 18 PVC TJ
Casing diameter	DN50 50 mm ID	DN50 50 mm ID	DN50 50 mm ID	DN50 50 mm ID	DN50 50 mm ID	DN50 50 mm ID
Casing stickup (m AGL)	0.670	0.695	0.657	0.726	0.519	0.579
Casing completion depth	18.0	15.0	11.0	18.1	18.0	18.0
Screen type	Class 18 PVC TJ	Class 18 PVC TJ	Class 18 PVC TJ	Class 18 PVC TJ	Class 18 PVC TJ	Class 18 PVC TJ
Screen diameter	DN50 50 mm ID	DN50 50 mm ID	DN50 50 mm ID	DN50 50 mm ID	DN50 50 mm ID	DN50 50 mm ID
Screen aperture (machine slot)	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Screen top	12.0	9.0	5.0	12.1	19.0	12.0
Screen base	18.0	15.0	11.0	18.1	25.0	18.0
Filter pack top	10.0	7.0	4.0	11.0	18.0	3.0
Filter pack base	12.0	9.0	5.0	12.1	19.0	12.0
Bentonite top	9.0	6.0	3.0	10.0	17.0	2.0
Bentonite base	10.0	7.0	4.0	11.0	18.0	3.0
Grout top	0.0	0.0	0.0	0.0	0.0	0.0

Bore ID	MW84	MW86	MW89	MW91	MW94	MW98
Grout base	9.0	6.0	3.0	10.0	17.0	2.0
Completion	Monument	Monument	Monument	Monument	Monument	Monument
Table notes: 1. Easting, northing, and stickup obtained from survey data. 2. Drilled and installation depths are metres below ground level (m BGL). 3. TJ- Threaded joint						

3.5 Bore development

The groundwater bores were developed by JAB Drilling after completing the installation (after waiting minimum 24 hours after grouting). Each of the newly installed groundwater bores were developed to remove residual drilling fines using compressed air injected into the bore ('air lifting') within the screened section. All development/purge water was captured in the pit and then disposed of at the CSE Eastern Seepage Collection Pond. Airlifting yields and development records are summarised in Table 3.5.

Table 3.5 Development records and airlifting yields

Bore ID	Screened depth (m BGL)	Screened lithology	Final airlift yield (L/s)	Development date	Development duration (min)
MW81	16-22	Breccia/tuff, with limonite-calcite bands	1.3	03/08/2023	70
MW82	18-24	Andesite	6.8	05/08/2023	80
MW83	17-23	Andesite	0.13	01/08/2023	95
MW84	12-18	Andesite	0.75	09/08/2023	55
MW85	9.5-15.5	Andesite	0.02	05/08/2023	25
MW86	9-15	Andesite	-	20/09/2023	DRY
MW89	5-11	Shale	0.02	11/08/2023	75
MW90	21-27	Shale	0.3	08/08/2023	120
MW91	12.1-18.1	Andesite	0.3	11/08/2023	90
MW94	19-25	Andesite/ Tuff/Shale	1.0	05/08/2023	85
MW98	12-18	Shale	0.05	05/08/2023	35

During development the field physicochemical parameters were measured and recorded (pH, electrical conductivity (EC), temperature, redox potential) by the supervising hydrogeologist. Bore development records are provided in Appendix F.

Bore development was carried out until field chemistry parameters stabilised and water was clear of drilling fines, with the exception of recovery bore MW85. The yield of MW85 was very low with minimal water entering the bore to be able to adequately flush the gravel pack and casing of drilling fines. The poor development result was confirmed when groundwater sample results were reviewed, where the groundwater indicated elevated pH, calcium, alkalinity (hydroxide and carbonate as CaCO3) inconsistent with the water quality from all the other sampled bores. Refer to the GHD *Groundwater Sampling Report* (2023) for further details. MW85 would benefit from further development effort utilising different development techniques (e.g., combination of surging, bailing, pumping, and lifting).

It was noted after the completion of the development that the EC readings appeared to be incorrect, later confirmed when comparing water quality result from the groundwater sampling), and therefore the EC readings for the development should not be relied upon.

3.6 Survey

On completion of the bore drilling and installation program, GHD's appointed surveyor (Fredriksen, MacLean & Associates) surveyed the newly installed groundwater monitoring and recovery bores for accurate location information. The bore survey consisted of measuring the top of casing and natural ground surface horizontal coordinates and elevations using RTK GNSS equipment (Trimble R12 receivers) with an expected accuracy of measurements of ±10 mm horizontally. The bore collars were levelled by a precise digital level (Leica DNA03) with an accuracy of ±1 mm/km. Bore coordinates were reported in GDA94 MGA Zone 56 and reduced levels (RL) measured in m AHD. Bore coordinates and elevation records are provided in Appendix G.

4 Aquifer testing

A program of slug testing of the monitoring bores, and pumping tests on the recovery bores was undertaken. The methodology and testing results are presented in this section.

4.1 Slug testing

4.1.1 Method

Falling and rising head slug tests were completed in five monitoring bores using a solid Waterra slug, utilising data loggers to monitor the water level recovery.

A Solinst Levelogger was lowered to approximately 5 m below the measured water level, which left enough space below the base of the anticipated slug deployment level. The data logger was programmed to collect rapid measurements of water level changes within the first few seconds of water displacement through to anticipated near to full recovery (90% pre-disturbance water level).

Once the data logger was deployed, the water level was measured and recorded on the field record sheet. The slug was lowered to the measured water level, then rapidly inserted in a quick, but controlled and smooth fashion so that the slug was fully submerged below the standing water level (falling head test). The water level was then measured again over time until the bore water level had recovered. One the water level had recovered the slug was then rapidly removed from the bore (rising head test) and similarly water level measurements recorded.

The slug test equipment (solid slugs, cords, shackles, and logger) was decontaminated between use in each bore by cleaning with potable water containing Liquinox, then triple-rinsed in deionised water.

The slug testing was completed with reference to Australian Standard AS 2368–1990 *Test pumping of water wells.*

4.1.2 Results

The slug test data were analysed using AQTESOLV, a commercial aquifer test software package (Duffield, 2007). Appropriate slug test solution methods were used to determine in situ aquifer hydraulic conductivity (K).

A summary of the slug test analysis results is presented in Table 4.1. Graphical results of the slug tests are provided in Appendix H.

Table 4.1 Slug test details and results

Bore ID	Screened geology	SWL (m bTOC)	Test type	Test No.	Maximum displacement (m)	Hydraulic conductivity (K) m/d	Analytical solution
MW84	Andesite	6.32	Falling head test	Test 1	0.7	2.6	Bouwer-Rice
			Rising head test	Test 1	1.1	3.6	Bouwer-Rice
			Falling head test	Test 2	0.8	3.7	Bouwer-Rice
			Rising head test	Test 2	1.3	3.6	Bouwer-Rice
MW89[(1)]	Shale	7.52	Rising head test	Test 1	0.5	0.2	Bouwer-Rice
MW91	Andesite	9.97	Falling head test	Test 1	0.45	7.7	Springer-Gelhar
			Rising head test	Test 1	0.7	7.7	Springer-Gelhar
MW94	Andesite / Tuff / Shale	9.53	Falling head test	Test 1	0.45	8.7	Bouwer-Rice
			Rising head test	Test 1	0.5	8.7	Bouwer-Rice
			Falling head test	Test 2	1.0	8.8	Bouwer-Rice
			Rising head test	Test 2	1.3	8.7	Bouwer-Rice

Bore ID	Screened geology	SWL (m bTOC)	Test type	Test No.	Maximum displacement (m)	Hydraulic conductivity (K) m/d	Analytical solution
MW98[2]	Shale	9.45	Falling head test	Test 1	0.7	0.00046	Bouwer-Rice
			Falling head test	Test 2	0.6	0.00088	Bouwer-Rice
			Rising head test	Test 2	0.6	0.00036	Bouwer-Rice

Table notes:

1. Only the rising head test was analysed, as the screen was partially saturated.
2. Construction of the bore has the filter pack extending above the saturated zone, therefore the initial slug test data points show the response to the filter pack, which has been disregarded. The line has been fitted along the long-term recovery rather than the initial displacement response.

The slug testing of the monitoring bores has yielded a relatively broad range of hydraulic conductivity, and this can be the case with fractured rock aquifers. Without having a larger data set of bores, it is difficult to assess what the average hydraulic conductivity of the fractured rock aquifer is. The number and nature of the fractures intersected by the bore can significantly influence the hydraulic conductivity estimates. For example, the lower hydraulic conductivity derived from bore MW98 may reflect the shale being very tight and massive, compared to the andesites.

The low yielding nature of the recovery bores, and transmissivity estimates being generally less than 2 m^2/day (refer section 4.2 below) support the fractured rock aquifer having a low hydraulic conductivity.

4.2 Pumping testing

4.2.1 Approach

A pumping test was completed on each of the 5 No. recovery bores, which included a step test followed by a constant rate test. Water level monitoring (via data logger) was conducted in up to four selected observation bores located close to the pumped recovery bore (refer to Figure 3.1 for bore locations).

The methodology for the step drawdown test and constant rate test is outlined below. A photo of the general pumping test setup is shown in Figure 4.1. The step test was undertaken to guide the selection of a flow rate for the constant rate testing.



Figure 4.1 General pumping test setup (location MW90)

First – Step drawdown test

- Water levels and depths of the selected observation bores were measured and recorded on the field record sheet. Data loggers were installed in the selected observation bores.
- Pumping test equipment and data loggers were installed in the recovery bore.
- Initial conditions were established by measuring the standing water levels in the pumped bore and observation bores for a period of time before the pumping test started. Note: If water levels in the aquifer changed due to recharge or other bores pumping, the commencement of the constant rate test was delayed until water level response stabilised.
- The pump was turned on and flow set at the first minimum of three step wise increasing flow rates. Each step lasted a minimum of 30 min and up to 1 hour each. A measurement of the flows and water levels were regularly recorded.
- The drawdown was consistently monitored via a direct read cable from the data logger connected to the laptop. Drawdown was reviewed toward the end of each step, and a decision was made for the next increase in flow rate. The flow rate was adjusted upward accordingly, ensuring that sufficient water remained above the pump. Where the available drawdown was exhausted (i.e., water level reached the pump intake level), the pump was turned off.
- Throughout each step, an accurate control on flow rates was maintained. Regular observations of water quality (sediment load, turbidity, cloudiness) and field water quality parameters (e.g., EC, temperature, dissolved oxygen (DO), Redox) were made throughout the testing.
- When the last step was complete, the pump was shut down and the recovery was monitored until at least 90% pre-disturbance water levels were achieved.
- Based on the results of the step test the constant rate test flow rate was determined.

Second – Constant rate test

- The constant rate test was started after allowing at least 90% recovery after the step test. Generally, the bore was left overnight to recover. In most cases the bore had fully recovered prior to commencing the constant rate test.
- Initial conditions were established by measuring the standing water levels in the pumped bore and observation bores for a period of time before the pumping test started. Note: If water levels in the aquifer changed due to recharge or other bores pumping, the commencement of the constant rate test was delayed until water level response stabilised.
- The bore was pumped at the selected flow rate and held for at least 4 hours, and in some cases up to 10 hours.
- Manual readings of the water level were taken periodically throughout the pumping test to confirm the water level measurements by the data loggers, and the field water quality was monitored periodically throughout the test.
- Water samples for laboratory analysis were collected within the first hour, and again within the last hour, prior to pump shut down.
- Upon shut down, recovery was monitored until at least 90% pre-disturbance water levels were achieved, prior to pumping test equipment removal.
- If the pumping bore went dry (i.e., the maximum available drawdown was exhausted), the pump was shut off and recovery monitored.

The pumping test program was completed as per the DPIE (2019) minimum requirements. On site supervision of the step test and constant rate test at each bore site was undertaken by GHD's appointed supervising hydrogeologist to monitor the testing and assess the data to determine the pumping rates and provide advice for adjustments to pumping testing based on the behaviour of the bore.

All water produced from the pumping tests was diverted to the Eastern Seepage Drain for onsite locations and directed to a 10,000 L water tank at bore MW90 (offsite location). Further details on the management of the wastewater are provided in Section 3.2.

4.2.2 Summary of testing completed

A summary of the pumping test program has been provided in Table 4.2. Review of climate observations from BOM climate station 039089 (Thangool Airport) indicated that no rainfall occurred during the testing period, i.e., no recharge during the pumping test period.

Table 4.2 Pumping test summary

Bore ID	Test Type	Date start	Duration (min)	Flow rate (L/s)	Bores monitored	Radial distance[1] (m)	Drawdown (m)
MW81	Step	3/8/2023	60	0.6, 1.0, 1.5, 2.0	MW81	0.0	Three steps completed. 7.5 m drawdown in fourth flow rate step.
	Constant	4/8/2023	470	1.6	MW81	0.0	6.0
					MW82	73.2	No obvious drawdown
					MW84	76.9	No obvious drawdown
MW82	Step	5/8/2023	120	1.0, 1.5, 2.0, 2.5	MW82	0.0	Four flow rate steps completed for around 8.5 m drawdown.
	Constant	7/8/2023	600	2.4	MW82	0.0	8.4
					MW84	145.1	No obvious drawdown
MW83	Step	1/8/2023	120	0.2, 0.3	MW83	0.0	Drawdowns had yet to stabilise in the second flow rate step.
		3/8/2023	205	0.1, 0.2 and 0.3	MW83	0.0	Drawdowns had yet to stabilise in the third flow rate step.
	Constant	2/8/2023	215	1.5	MW83	0.0	7.6
					ESC1	55	No obvious drawdown
					MW85	108.4	Recovery response
MW85	Constant	8/8/2023	18	0.1	MW85	0.0	*Short duration
					ESC1	127.4	No obvious drawdown
					MW51	72.5	No obvious drawdown
					MW29	126.8	No obvious drawdown
					MW83	108.4	No obvious drawdown
MW90	Step	8/8/2023	55	0.2	MW90	0.0	Refer discussion below.
	Constant	10/8/2023	540	0.21 (300)[2] 0.3 (240)	MW90	0.0	4.0
					MW89	28	No obvious drawdown
					MW43	45	No obvious drawdown
					MW91	85	No obvious drawdown

Table note:

1. Radial distance from pumping bore.
2. Values in parenthesis represent duration of flow rate (min).

4.2.3 Results

General

In terms of conceptualisation the pumping bores intersect the Lochenbar Formation, which predominantly comprises andesites, and forms a fractured rock aquifer system. A fault has been interpreted on the eastern side of the ash pond (Daniell 2022).

In general terms, most of the recovery bores intersected a thin sequence of fine grained materials (typically 1 m to 5 m in thickness) overlying fractured rocks which increased in competency with increasing depth. The upper 0.5 m represent fill materials or reworked residual soils, whilst the remainder of the upper fine grained sequence comprised saprolitic / weathered rock, e.g., silty and sandy clays to clays, commonly with gravels and cobbles of less weathered rock. These materials were logged as being dry, and were weak, given that they were easily penetrated with a blade bit. In most locations, the standing water level was marginally shallower than the recorded water strike (refer Table 3.2). Compressed air drilling in low permeability materials can mask the true water intersection as it can dry cuttings if seepage rates are low.

Under these circumstances, the aquifer is conceptualised as an unconfined system. The pumping test data was analysed using a number of numerical and graphical solutions to the transient well equation, with the objective to determine representative aquifer hydraulic parameters of transmissivity and storativity. Initially confined methods, e.g., Thies and Cooper-Jacob approaches were applied as early time responses can be related to elastic storage, however, to improve curve matches, alternate aquifer model approaches were applied, e.g., Neuman unconfined model. Inspection of pumping test drawdown responses did not identify an obvious delayed yield response, which may be related to the short duration of the testing.

Bore MW81

Aquifer response to pumping has been provided in Appendix I for the pumping bore MW81 and the two observation bores, MW82 and MW84. The two observation bores exhibited no obvious response to pumping, indicating that the pumping radius of influence had not extended over 70 m during the approximate 7.8 hrs of constant rate pumping at 1.6 L/s. Calculation of an aquifer storage value was therefore not undertaken.

Water levels were around 8.1 m BGL at the commencement of pumping and were drawn down 6 m to 14 m BGL at the completion of pumping. The pump intake was set at 20.88 m which was approximately 1 m off the total constructed depth. The drawdown response was relatively smooth, and the bore recovered greater than 90% following the cessation of pumping.

Field water quality parameters were recorded from the discharge and have been shown in Appendix I. Most of the field parameters remained relatively stable throughout the pumping, however, the ORP showed a gradual declining trend, i.e., becoming more reduced.

The data from pumping bore MW81 was initially analysed using the Theis and Cooper-Jacob solutions, however, there was a poor match to both the drawdown and derivative data, indicating that these (confined aquifer) models did not accurately reflect the behaviour of the unconfined aquifer system. An improved match to the drawdown and form of the derivative data was obtained using the Neuman model, which was applied to the drawdown data, and the recovery data, with the latter being completed using the Agarwal (1980) transformation. The transmissivity derived from these approaches was 3 m^2/day and 0.4 m^2/day (recovery data). It is noted that the delayed yield effect was not evident in the drawdown response.

Bore MW82

Aquifer response to pumping has been provided in Appendix I for the pumping bore MW82 and the observation bore MW84. The observation bores exhibited no obvious response to pumping, indicating that the pumping radius of influence had not extended over 145 m during the approximate 10 hrs of constant rate pumping at 2.4 L/s. Calculation of an aquifer storage was therefore not undertaken.

Water levels were around 7.9 m BGL at the commencement of pumping and were drawn down 8.4 m to 16.3 m BGL at the completion of pumping. The pump intake was set at 22.4 m which was approximately 1 m off the total constructed depth. The drawdown response was relatively smooth, and the bore recovered greater than 90% within a few hours following the cessation of pumping.

The data from pumping bore MW82 was initially analysed using the Theis and Cooper-Jacob solutions, however, there was a poor match to both the drawdown and derivative data, indicating that these models did not accurately reflect the behaviour of the conceptualised unconfined aquifer system. An improved match to the drawdown and form of the derivative data was obtained using the Neuman model, which was applied to the drawdown data, and the recovery data, with the latter being completed using the Agarwal (1980) transformation. The transmissivity derived from these approaches was 0.8 m^2/day and 0.85 m^2/day for the pumping and recovery data respectively. It is noted that the delayed yield effect was not evident in the drawdown response.

Water quality was monitored during the step drawdown test, and this indicated that the SPC, pH and ORP were all declining during the pumping test. Water quality was also monitored during the constant rate test which indicated that SPC, pH and ORP were all declining, consistent with the step test monitoring.

Bore MW83

Aquifer response to pumping has been provided in Appendix I for the pumping bore MW83 and the two observation bores ESC1 and MW83. Bore ESC4 was not used as an observation bore, as previous pumping from existing recovery bores had affected the water level. The nearest observation bore, bore ESC1 exhibited no obvious response to pumping, however, bore MW85 showed a partial recovery response during the test. This response is unusual and seems unrelated to the pumping of bore MW83. Bore MW85 is screened at shallower interval relative to pumping bore MW83 and is further remote from the bore relative to the other observation bore ESC1. The Noordbergum effect can result in water level rises in overlying aquifer, however, it is unusual that it has not been identified in nearer bores, and in fractured rock terrain. It is possible that pumping from nearby existing recovery bores had impacted the water level in bore ESC4. As a consequence, data from bore ESC4 has not been applied in the analysis.

As there was no obvious movement in bore ESC1, the pumping radius of influence has not extended over 55 m after 3 hrs of constant rate pumping at 1.7 L/s. Calculation of an aquifer storage was therefore not undertaken.

Water levels were around 6.3 m BGL at the commencement of pumping and were drawn down 7.6 m to 14 m BGL at the completion of pumping. The pump intake was set at 21.9 m which was approximately 1 m off the total constructed depth. The drawdown response was relatively smooth, and the bore recovered greater than 90% within a few hours following the cessation of pumping.

The data from pumping bore MW83 was initially analysed using the Theis and Cooper-Jacob solutions, however, there was a poor match to both the drawdown and derivative data, indicating that these models did not accurately reflect the behaviour of the unconfined aquifer system. An improved match to the drawdown and form of the derivative data was obtained using the Neuman model, which was applied to the drawdown data, and the recovery data, with the latter being completed using the Agarwal (1980) transformation. The transmissivity derived from these approaches was 2.5 m^2/day and 1.1 m^2/day for the pumping and recovery data respectively. Match to both drawdown and derivative data was considered better for the recovery data, i.e., this is considered a more reliable estimate. It is noted that the delayed yield effect was not evident in the drawdown response.

Water quality was monitored during the step drawdown test, and this indicated that the DO and ORP were both declining during the pumping test. SPC and pH were generally stable throughout the duration of pumping.

Bore MW85

Bore MW85 did not yield much during drilling and the bore rapidly dewatered at a flow rate of 0.1 L/s. The aquifer response to pumping has been provided Appendix I. Owing to the short duration of pumping, no drawdown response was observed in the monitoring bores.

Although the bore was dewatered after 18 mins of pumping, recovery data was obtained from the pumping bore. A transmissivity of 0.02 m^2/day was derived from the bore, however, this is considered to be of low reliability. This is because it was obtained using the Theis recovery method, and other bores analysed at the site do not respond as a Theissian aquifer, i.e., the aquifer does not behave a 'model' confined aquifer.

Bore MW90

Aquifer response to pumping has been provided in Appendix I for the pumping bore MW90 and the three observation bores, MW89, MW43 and MW91. The three observation bores exhibited no obvious response to pumping, indicating that the pumping radius of influence had not extended over 28 m over the approximate 4.5 hrs

of constant rate pumping at 0.21 L/s, and 4 hrs at 0.3 L/s. Calculation of an aquifer storage was therefore not undertaken.

Water levels were around 6.7 m BGL at the commencement of pumping and were drawn down 4 m to 11 m BGL at the completion of pumping. The pump intake was set at 26 m which was approximately 1 m off the total constructed depth. Owing to the small drawdown initially, the flow rate was increased from 0.21 L/s to 0.3 L/s in order to stress the bore. The drawdown response was relatively smooth, and the bore recovered greater than 90% within a few hours of the cessation of pumping.

The data from pumping bore MW90 was initially analysed using the Theis and Cooper-Jacob solutions, however, there was a poor match to both the drawdown and derivative data, indicating that these models did not accurately reflect the behaviour of the unconfined aquifer system. An improved match to the drawdown and form of the derivative data was obtained using the Neuman model, which was applied to the drawdown data, and the recovery data, with the latter being completed using the Agarwal (1980) transformation. The transmissivity derived from these approaches was 1.3 m^2/day and 0.87 m^2/day for the pumping and recovery data respectively. It is noted that the delayed yield effect was not evident in the drawdown response.

Water quality was monitored during the constant rate test, and this indicated that the DO and ORP were both fluctuating but overall had an increasing trend. SPC and pH were generally stable throughout the duration of pumping.

A short duration step test was attempted on bore MW90, however, it was not successfully completed. The bore was initially pumped at 0.2 L/s for 55 min and this consumed approximately 3 m of drawdown. When the flow rate was increased to 0.3 L/s, the drawdowns in the bore fell rapidly to 11 m and did not appear to be stabilising. The flow rate was backed off to 0.15 L/s which resulted in some recovery within the bore.

5 Conclusions

Field investigations were undertaken to characterise the ground conditions on the southern embankment of the Callide Ash Dam. The program resulted in the construction 5 No. (DN150) recovery bores and an additional 6 No. monitoring bores (DN50). Bore construction was consistent with the NUDLC (2020) minimum requirements.

Each of the bores intersected the fractured rock aquifer, which largely comprised andesitic rocks, and shale in the western locations. Bore yields determined from air lift development indicated a range of 0.1 L/s to 2 L/s. Aquifer slug testing was undertaken on monitoring bores and hydraulic conductivities ranged from $3.6x10^{-4}$ m/day to 9 m/day.

Recovery bores underwent step drawdown and constant rate testing. Bore MW85 was low yielding and could not sustain flow rates greater than 0.1 L/s. Bore MW90 was marginally better, producing 0.3 L/s. Recovery bores MW81, MW82 and MW83 sustained flow rates over 1.5 L/s. As obvious movement in monitoring bores was not identified, aquifer storage coefficients could not be determined from the testing. Derivation of storage coefficients would require either a) a longer duration pumping test or b) time-series of water level monitoring data. Aquifer transmissivities ranged from 0.3 m^2/day to 3 m^2/day.

GHD makes the following recommendations:

– The monitoring bores should be incorporated into the CSE monitoring program.
– Until they are equipped with production pumps, the recovery bores should also be added to the monitoring program. Following equipping, recovery bore monitoring requirements should be reviewed to inform their operation, e.g., metering, drawdown, flow rates etc.
– MW85 would benefit from further development effort utilising different development techniques (e.g., combination of surging, bailing, pumping, and lifting).
– A maintenance program is implemented to protect your recovery and monitoring bores and further details have been provided in Appendix J.

6 References

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Appendices

Appendix A

Services clearance report

Contact:	Beau Atkinson	Created:	Wed 21 June 12:02 2023
Company:	GeoRadar Australia	Location:	Biloela
Phone:	0477373434	Title:	GHD - Bore Holes
Email:	beau@georadar.net.au	No. Items:	18

(1)



872.jpg

Created: Wed 21 June 12:02 2023

MW88 - 5m x 5m area cleared for bore hole. No services detected electronically and no usable GPR images acquired.

(2)



874.jpg

Created: Wed 21 June 12:16 2023

MW92 - 5m x 5m area cleared for bore hole. No services detected electronically and no usable GPR images acquired.

Contact:	Beau Atkinson	Created:	Wed 21 June 12:02 2023
Company:	GeoRadar Australia	Location:	Biloela
Phone:	0477373434	Title:	GHD - Bore Holes
Email:	beau@georadar.net.au	No. Items:	18

(3)



875.jpg

Created: Wed 21 June 12:25 2023

MW87 - 5m x 5m area cleared for bore hole. No services detected electronically and no usable GPR images acquired.

(4)



876.jpg

Created: Wed 21 June 12:48 2023

MW91 - 5m x 5m area cleared for bore hole. No services detected electronically and no usable GPR images acquired.

Contact:	Beau Atkinson	Created:	Wed 21 June 12:02 2023
Company:	GeoRadar Australia	Location:	Biloela
Phone:	0477373434	Title:	GHD - Bore Holes
Email:	beau@georadar.net.au	No. Items:	18

(5)



877.jpg

Created: Wed 21 June 12:49 2023

MW91 - Telstra running just outside of 5x5 area. Approximately 2.5m off fence at 600mm deep.

(6)



878.jpg

Created: Wed 21 June 13:02 2023

MW89 - 5m x 5m area cleared for bore hole. No services detected electronically and no usable GPR images acquired.

Contact:	Beau Atkinson	Created:	Wed 21 June 12:02 2023
Company:	GeoRadar Australia	Location:	Biloela
Phone:	0477373434	Title:	GHD - Bore Holes
Email:	beau@georadar.net.au	No. Items:	18

(7)



879.jpg

Created: Wed 21 June 13:08 2023

MW90 - 5m x 5m area cleared for bore hole. No services detected electronically and no usable GPR images acquired.

(8)



880.jpg

Created: Wed 21 June 14:24 2023

MW86 - 5m x 5m area cleared. No Services detected electronically. Terrain unsuitable for GPR.

Contact:	Beau Atkinson	Created:	Wed 21 June 12:02 2023
Company:	GeoRadar Australia	Location:	Biloela
Phone:	0477373434	Title:	GHD - Bore Holes
Email:	beau@georadar.net.au	No. Items:	18

(9)



881.jpg

Created: Wed 21 June 14:25 2023

MW86 - marked locations on fence.

(10)



882.jpg

Created: Wed 21 June 14:25 2023

MW86 - Marked location on fence.

Contact:	Beau Atkinson	Created:	Wed 21 June 12:02 2023
Company:	GeoRadar Australia	Location:	Biloela
Phone:	0477373434	Title:	GHD - Bore Holes
Email:	beau@georadar.net.au	No. Items:	18

(11)

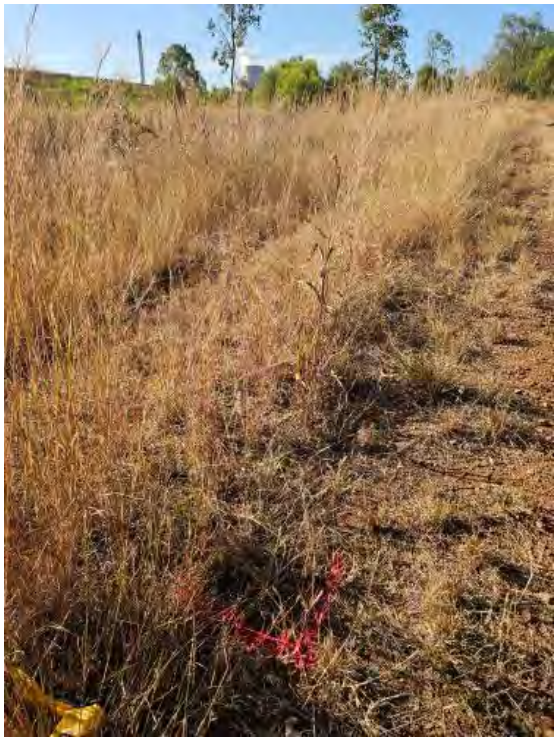


883.jpg

Created: Wed 21 June 14:34 2023

MW94 - 5m x 5m area cleared. No Services detected electronically. Terrain unsuitable for GPR.

(12)



884.jpg

Created: Wed 21 June 14:46 2023

MW85 - 5m x 5m area cleared. No Services detected electronically. Terrain unsuitable for GPR.

Contact: Beau Atkinson
Company: GeoRadar Australia
Phone: 0477373434
Email: beau@georadar.net.au

Created: Wed 21 June 12:02 2023
Location: Biloela
Title: GHD - Bore Holes
No. Items: 18

(13)



885.jpg

Created: Wed 21 June 14:55 2023

MW84 - 5m x 5m area cleared. No Services detected electronically. Terrain unsuitable for GPR.

(14)



886.jpg

Created: Wed 21 June 15:22 2023

MW82 - 5m x 5m area cleared for bore hole. No services detected electronically and no usable GPR images acquired.

Contact: Beau Atkinson
Company: GeoRadar Australia
Phone: 0477373434
Email: beau@georadar.net.au

Created: Wed 21 June 12:02 2023
Location: Biloela
Title: GHD - Bore Holes
No. Items: 18

(15)



887.jpg

Created: Wed 21 June 15:28 2023

MW83a - 5m x 5m area cleared for bore hole. No services detected electronically. Terrain unsuitable for GPR.

(16)



888.jpg

Created: Wed 21 June 15:31 2023

MW83b - 5m x 5m area cleared for bore hole. No services detected electronically. Terrain unsuitable for GPR.

Contact:	Beau Atkinson	Created:	Wed 21 June 12:02 2023
Company:	GeoRadar Australia	Location:	Biloela
Phone:	0477373434	Title:	GHD - Bore Holes
Email:	beau@georadar.net.au	No. Items:	18

(17)



889.jpg

Created: Wed 21 June 15:41 2023

MW81 - 5m x 5m area cleared for bore hole. No services detected electronically. Terrain unsuitable for GPR.

(18)



890.jpg

Created: Wed 21 June 16:05 2023

MW49b - 5m x 5m area cleared for bore hole. No services detected electronically. Terrain unsuitable for GPR.

Contact: Beau Atkinson
Company: GeoRadar Australia
Phone: 0477373434
Email: beau@georadar.net.au

Created: Wed 21 June 12:02 2023
Location: Biloela
Title: GHD - Bore Holes
No. Items: 18

DISCLAIMER (LEGISLATIVE DUTY OF CARE)

If the assets have not been exposed by hydroexcavation, or manual digging, Georadar Australia Pty Ltd and its servants and / or agents hold no responsibility whatsoever for any asset strike or asset damage

Appendix B

Waste tracking records

Vac truck log

Waste Transport Certificate

Laboratory certificate

Callide Groudnwater Bore Drilling Project
Vacuum Excavation Truck Transport Record (onsite)

DATE	MATERIAL	QTY	UOM	SOURCE	DESTINATION	TRUCK
12/07/2023	WASTE WATER	5	KL	84	SEDIEMNT POND	11KL VAC TRUCK
13/07/2023	WASTE WATER	3	KL	81	SEDIEMNT POND	11KL VAC TRUCK
13/07/2023	WASTE WATER	41	KL	82	SEDIEMNT POND	11KL VAC TRUCK
14/07/2023	WASTE WATER	1	KL	84	SEDIEMNT POND	11KL VAC TRUCK
14/07/2023	WASTE WATER	2	KL	83	SEDIEMNT POND	11KL VAC TRUCK
14/07/2023	WASTE WATER	5	KL	81	SEDIEMNT POND	11KL VAC TRUCK
17/07/2023	TAILINGS	4	KL	81	SEDIEMNT POND	4KL VAC TRUCK
17/07/2023	TAILINGS	4	KL	82	SEDIEMNT POND	4KL VAC TRUCK
17/07/2023	WASTE WATER	12	KL	82	SEDIEMNT POND	11KL VAC TRUCK
17/07/2023	WASTE WATER	0.5	KL	83	SEDIEMNT POND	11KL VAC TRUCK
18/07/2023	TAILINGS	2	KL	83	SEDIEMNT POND	4KL VAC TRUCK
18/07/2023	TAILINGS	1	KL	82	SEDIEMNT POND	4KL VAC TRUCK
18/07/2023	TAILINGS	1	KL	81	SEDIEMNT POND	4KL VAC TRUCK
19/07/2023	WASTE WATER	3	KL	85	SEDIEMNT POND	11KL VAC TRUCK
20/07/2023	WASTE WATER	3	KL	94	SEDIEMNT POND	11KL VAC TRUCK
21/07/2023	TAILINGS	1	KL	86	SEDIEMNT POND	4KL VAC TRUCK
21/07/2023	TAILINGS	1	KL	94	SEDIEMNT POND	4KL VAC TRUCK
21/07/2023	TAILINGS	1	KL	95	SEDIEMNT POND	4KL VAC TRUCK
22/07/2023						
23/07/2023						
24/07/2023						
25/07/2023						
26/07/2023						
27/07/2023						
28/07/2023						
29/07/2023						
30/07/2023						
31/07/2023						
1/08/2023	WASTE WATER	0	KL	94		11KL VAC TRUCK
2/08/2023						
3/08/2023						
4/08/2023						
5/08/2023						
6/08/2023						
7/08/2023						
8/08/2023						
9/08/2023						
10/08/2023	WASTE WATER	20	KL	TANK	FLATFILTERS	11KL VAC TRUCK
11/08/2023	WASTE WATER	5	KL	TANK	FLATFILTERS	11KL VAC TRUCK

Queensland Government

Waste Transport Certificate

Q 01956183

Part 1

This section is to be completed by the Generator or Storer of waste, must be one site/location per certificate

Name, Description and Chemical Composition of the Waste
WATER CONTAINING PFAS

U.N. Class | Subsid Risk | U.N. Number | Bulk/No of Packaging | Type of Packaging | Packaging Grp
 | | | | TANKER |

Amount of Waste: 11000 (✓ Litres ○ Cubic Metres ○ Kilograms) | Physical Nature: L | Waste Code No: M270

Name of Waste Generator
CS ENERGY

Address where waste was generated
COCUPS RD BILOELA QLD Postcode 4715

Contact Name: LAURA CUTAJAR | Phone No.: (04) 87140296 | ABN/ACN: 078848745

Environmental Authority No (if applicable): EPPR00536313 | Local Government Area: BANANA

Nominated Disposal/Treatment/Storage Facility
FLAT FILTERS

Name of Transporter Company
CALLIDE PLUMBING SERVICES

Address
44 RAEDON STREET
BILOELA Postcode 4715

Vehicle No 1 Rego No.: XQ95XE | Trailer Rego No.: | ABN/ACN: 60787217 7

Environmental Authority No.: EA0002928 | Mode of Transport: ✓ Road ☐ Rail ☐ Air ☐ Sea

I declare that to the best of my knowledge and belief the above information is true and correct
(Name and Position)
LAURA CUTAJAR ENVIRONMENT ADVISOR

Signature: L-Cutt | Date: 10/08/2023

Part 2

To be completed by the Waste Transporter

I acknowledge the receipt of the waste described in part 1. Discrepency: ☐ Waste Type ☐ Volume received ☐ Other

If applicable I am acting as an agent for: ✓ Generator ☐ Receiver

Name: JOSH WALDOCK | Phone No.: ( ) 49921035

Signature: J.Wall | Date: 10/08/2023

Part 3

To be completed by the Facility Receiving Waste

Name of Receiving Facility
FLAT FILTERS

Address
39375 BURNETT HWY THANGOOL Postcode 4716

ABN/ACN | Disposal/Treatment Code: D12 | Physical Nature: L | Waste Code No: M270

Environmental Authority No.: EPPR02422414 | Amount of Waste: 11000 (● Litres ○ Cubic Metres ○ Kilograms)

If applicable I am acting as an agent for the Generator ☐

Discrepancy: ☐ Waste Type ☐ Volume Received ☐ Transporter Details ☐ Other

I acknowledge the receipt of the waste described in part 1.
(Name and Position)
TROY HOGAN MANAGER

Phone No.: (07) 39752328

Signature | Date: 10/08/2023

WHITE COPY - TO BE FORWARDED TO DES BY THE RECEIVER (PARTS 1, 2 & 3 COMPLETED)
PINK COPY - TO BE FORWARDED TO DES BY THE GENERATOR (PARTS 1 & 2 COMPLETED)
GREEN COPY - TO BE RETAINED BY THE GENERATOR (PART 1 & 2 COMPLETED)
YELLOW COPY - TO BE RETAINED BY THE RECEIVER (PARTS 1, 2 & 3 COMPLETED)
BLUE COPY - TO BE RETAINED BY THE WASTE TRANSPORTER (PARTS 1 & 2 COMPLETED)
PLEASE FORWARD DES COPIES (WITHIN 7 DAYS) TO

Waste Transport Certificate

Queensland Government

Q 01956184

Part 1

This section is to be completed by the Generator or Storer of waste, must be one site/location per certificate

Name, Description and Chemical Composition of the Waste: PFAS CONTAINING WATER CONT PFAS

U.N. Class: | Subsid Risk: | U.N. Number:

Bulk/No of Packaging: | Type of Packaging: TANKER | Packaging Grp:

Amount of Waste: 9000 ☑ Litres ○ Cubic Metres ○ Kilograms

Physical Nature: ☑ | Waste Code No: M270

Name of Waste Generator: CS ENERGY

Address where waste was generated: COCUPS ROAD BILOELA

Postcode: 4715

Contact Name: LAURA CUTAJAR | Phone No.: (04) 87140296 | ABN/ACN: 07888745

Environmental Authority No (if applicable): EPPR00536313 | Local Government Area: BANANA

Nominated Disposal/Treatment/Storage Facility: FLAT FILTERS

Name of Transporter Company: CALLIDE PLUMBING SERVICES

Address: 44 RAEDON STREET BILOELA

Postcode: 4715

Vehicle No 1 Rego No.: XQ95XE | Trailer Rego No.: | ABN/ACN: 60787217

Environmental Authority No.: EA0002928

Mode of Transport: ☑ Road ☐ Rail ☐ Air ☐ Sea

I declare that to the best of my knowledge and belief the above information is true and correct
(Name and Position): LAURA CUTAJAR ENVIRONMENT ADVISOR

Signature: L Cutt | Date: 10/08/2023

Part 2

To be completed by the Waste Transporter

I acknowledge the receipt of the waste described in part 1. Discrepency: ☐ Waste Type ☐ Volume received ☐ Other

If applicable I am acting as an agent for: ☐ Generator ☐ Receiver

Name: JOSH WALDOCK | Phone No.: ( ) 49921035

Signature: J. Waldock | Date: 10/08/2023

Part 3

To be completed by the Facility Receiving Waste

Name of Receiving Facility: FLAT FILTERS

Address: 39375 BURNETT HWY THANGOOL

Postcode: 4716

ABN/ACN: | Disposal/Treatment Code: D12 | Physical Nature: L | Waste Code No: M270

Discrepancy: ☐ Waste Type ☐ Volume Received ☐ Transporter Details ☐ Other

Environmental Authority No.: EPPR02424914 | Amount of Waste: 9000 ☑ Litres ○ Cubic Metres ○ Kilograms

If applicable I am acting as an agent for the Generator ☐

I acknowledge the receipt of the waste described in part 1.
(Name and Position): PM YARD MANAGER

Phone No.: (04) 39752328

Signature: | Date: 10/08/2023

WHITE COPY - TO BE FORWARDED TO DES BY THE RECEIVER (PARTS 1, 2 & 3 COMPLETED)
PINK COPY - TO BE FORWARDED TO DES BY THE GENERATOR (PARTS 1 & 2 COMPLETED)
GREEN COPY - TO BE RETAINED BY THE GENERATOR (PART 1 & 2 COMPLETED)
YELLOW COPY - TO BE RETAINED BY THE RECEIVER (PARTS 1, 2 & 3 COMPLETED)
BLUE COPY - TO BE RETAINED BY THE WASTE TRANSPORTER (PARTS 1 & 2 COMPLETED)

PLEASE FORWARD DES COPIES (WITHIN 7 DAYS) TO WASTE TRACKING, GPO BOX 2454, BRISBANE, QLD 4001.

Pollution Hotline No. 1300 130 372

W 6894129537

BULK TANKER

Amount of Waste: 5000 — Litres ✓ — Cubic Metres — Kilograms

Physical Nature: L

Waste Code No: M270

Part 1

This section is to be completed by the Generator or Storer of waste, must be one site/location per certificate

Name of Waste Generator: CS ENERGY

Address where waste was generated: 959 BILOELA CALLIDE RD

BILOELA — Postcode: 4715

Contact Name: S BULTEN — Phone No.: (07) 49292383 — ABN/ACN:

Environmental Authority No (if applicable): EPPR00536313 — Local Government Area: BANANA

Nominated Disposal/Treatment/Storage Facility: FLAT FILTERS

Name of Transporter Company: CALCI DET PLUMBING SERVICES PTY LTD

Address: 44 RAEDAN ST BILOELA — Postcode: 4715

Vehicle No 1 Rego No.: XQ95XE — Trailer Rego No.: — ABN/ACN: 60787217 7

Environmental Authority No.: EA0002928

Mode of Transport: ✓ Road ☐ Rail ☐ Air ☐ Sea

I declare that to the best of my knowledge and belief the above information is true and correct

(Name and Position): S BULTEN

Signature: [signature] — Date: 11/08/2023

Part 2

To be completed by the Waste Transporter

I acknowledge the receipt of the waste described in part 1. Discrepency: ☐ Waste Type ☐ Volume received ☐ Other

If applicable I am acting as an agent for: ☐ Generator ☐ Receiver

Name: JASON SETH — Phone No.: ( ) 49921035

Signature: [signature] — Date: 11/08/2023

Part 3

To be completed by the Facility Receiving Waste

Name of Receiving Facility: FLAT FILTERS

Address: 3937 BURNETT HWY THANGOOL — Postcode: 4716

ABN/ACN: — Disposal/Treatment Code: D12 — Physical Nature: L — Waste Code No: M270

Discrepancy: ☐ Waste Type ☐ Volume Received ☐ Transporter Details ☐ Other

Environmental Authority No.: EPPR02422414 — Amount of Waste: 5000 — ✓ Litres ○ Cubic Metres ○ Kilograms

If applicable I am acting as an agent for the Generator ☐

I acknowledge the receipt of the waste described in part 1.

(Name and Position) — Phone No.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2323207**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: PO BOX 373 GLADSTONE QLD 4680	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 01-Aug-2023 10:10
Order number	: ----	Date Analysis Commenced	: 02-Aug-2023
C-O-C number	: ----	Issue Date	: 04-Aug-2023 12:24
Sampler	: Brian Llewellyn		
Site	:		
Quote number	: EN/005		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X-SUT PFAS Super Ultra Trace: The high recovery laboratory control standard for 10:2 FTS is deemed acceptable as associated results are less than the limit of reporting.
- EP231X-LL(TOP) PFAS TOPA: Sample 'TANK_01' (EB2323207-001) required dilution due to matrix interferences. LOR values have been adjusted accordingly. The LOR of PFOS has been raised further due to additional matrix interferences.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TANK_01	----	----	----	----
				Sampling date / time	28-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2323207-001	--------	--------	--------	--------	
				Result	----	----	----	----	
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	**0.164**	----	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	**0.191**	----	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	**1.09**	----	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	**0.027**	----	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.140	----	----	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.010	----	----	----	----	
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	**0.13**	----	----	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	**0.063**	----	----	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	**0.204**	----	----	----	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	**0.029**	----	----	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	**0.046**	----	----	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.010	----	----	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.010	----	----	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.010	----	----	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.010	----	----	----	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.010	----	----	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.025	----	----	----	----	
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.010	----	----	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.025	----	----	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.025	----	----	----	----	

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TANK_01	----	----	----	----
				Sampling date / time	28-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323207-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.025	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.025	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.010	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.010	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.010	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.010	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.010	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.010	----	----	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		**1.94**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		**1.09**	----	----	----	----
^ **Sum of TOP C4 - C14 as Fluorine**	----	0.002	µg/L		**1.20**	----	----	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		**1.94**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.189**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.226**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**1.27**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0661**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TANK_01	----	----	----	----
				Sampling date / time	28-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323207-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.168**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.135**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**0.0596**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.0358**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**0.201**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**0.0650**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TANK_01	----	----	----	----
				Sampling date / time	28-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323207-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**1.44**	----	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**2.12**	----	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		**2.42**	----	----	----	----
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**97.2**	----	----	----	----
13C8-PFOA	----	0.002	%		**103**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**124**	----	----	----	----
13C8-PFOA	----	0.0005	%		**117**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	34	137
13C8-PFOA	----	56	129
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Appendix C

EPS pit rehabilitation report

TN	Photo
81	
82	

83	

84	

85	
86	

89	
90	

91	
93 b	

94	
87	NA – Removed from scope
88	NA – Removed from scope
92	NA – Removed from scope

Appendix D

Bore logs, chip samples, and ITP records

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW81

SHEET 1 OF 3

Position : 258295.5 E 7304124.7 N MGA94 56	**Surface RL:** 209.71m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 12/7/2023	**Date Completed :** 12/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	205mm Rotary Air with Blade Bit	None	▽ Temp WL 8.57m		0.40 (209.31)		CH	FILL, Silty CLAY, red-brown, with coarse-grained road base (re-worked natural material with fill)	D	St	Samples: MW81_DC_0.0-25.0 MW81_SS_0.45-0.50		Casing stickup 0.474m
							CH	Silty CLAY, green-grey and pale yellow-brown flecks, with inclusions of weathered rock (andesite), residual soils	D	St	From 0.5 to 2.0m, weak to medium strength zones		
1													
2					2.00 (207.71)		CL	Sandy CLAY, brown, fine-grained sand, with inclusions of highly to completely weathered rock (andesite?), green and pale yellow-brown flecks, residual soils	D	St			
3					3.00 (206.71)			BRECCIA/TUFF, green-grey and pale yellow-brown flecks, highly weathered			From 3.0 to 7.8m, medium strenght bands of between 50 to 100mm thickness		Cement grout 3% bentonite
4								From 4.0 m, slightly yellow-brown and green-grey					
5													150mm diameter Class 9 PVC casing
6													
7													
8					7.80 (201.91)			BRECCIA/TUFF?, pale yellow-brown and brown, limonite inclusions			From 8.0 to 8.3m, medium strength band		
9											Temporary water level after drilling 8.57mBGL		
10					10.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW81

SHEET 2 OF 3

Position : 258295.5 E 7304124.7 N MGA94 56	**Surface RL:** 209.71m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 12/7/2023	**Date Completed :** 12/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	205mm Rotary Air with Blade Bit	None	GWE at 12m		(199.71)			BRECCIA/TUFF?, green-grey, with yellow-brown and pale yellow limonite inclusions			At 11.0m, 50mm thick medium strenght band At 12.0m, water strike At 15.0m, making water with flow of 1.4L/s. At 19.0m, flow of 1.9L/s		Cement grout 3% bentonite 150mm diameter Class 9 PVC casing Bentonite Filter pack 5 mm gravel Top of screen at 16.0m 150mm diameter stainless steel screen 1mm slot
12													
13													
14													
15													
16								At 16.0m, medium strength green-grey limonite-calcite bands					
17													
18													
19													
20					20.00			From 19.5m, grades to pale yellow-brown and green limonite bands, medium strength					

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW81

SHEET 3 OF 3

Position : 258295.5 E 7304124.7 N MGA94 56 **Surface RL:** 209.71m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 12/7/2023 **Date Completed :** 12/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	205mm Rotary Air with Blade Bit	None			(189.71)			BRECCIA/TUFF?, pale yellow-brown and green-grey					150mm diameter stainless steel screen 1mm slot
22											At 22.0m, flow of 1.9L/s		Base of screen at 22.0m
23					23.00 (186.71)			BRECCIA/TUFF?, green-grey, dark grey bands			At 23.0m, flow of 2.15L/s		Backfill with filter pack 3mm gravel
24													
25					25.00 (184.71)			End of borehole at 25.00 metres. Target Depth					
26													
27													
28													
29													
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

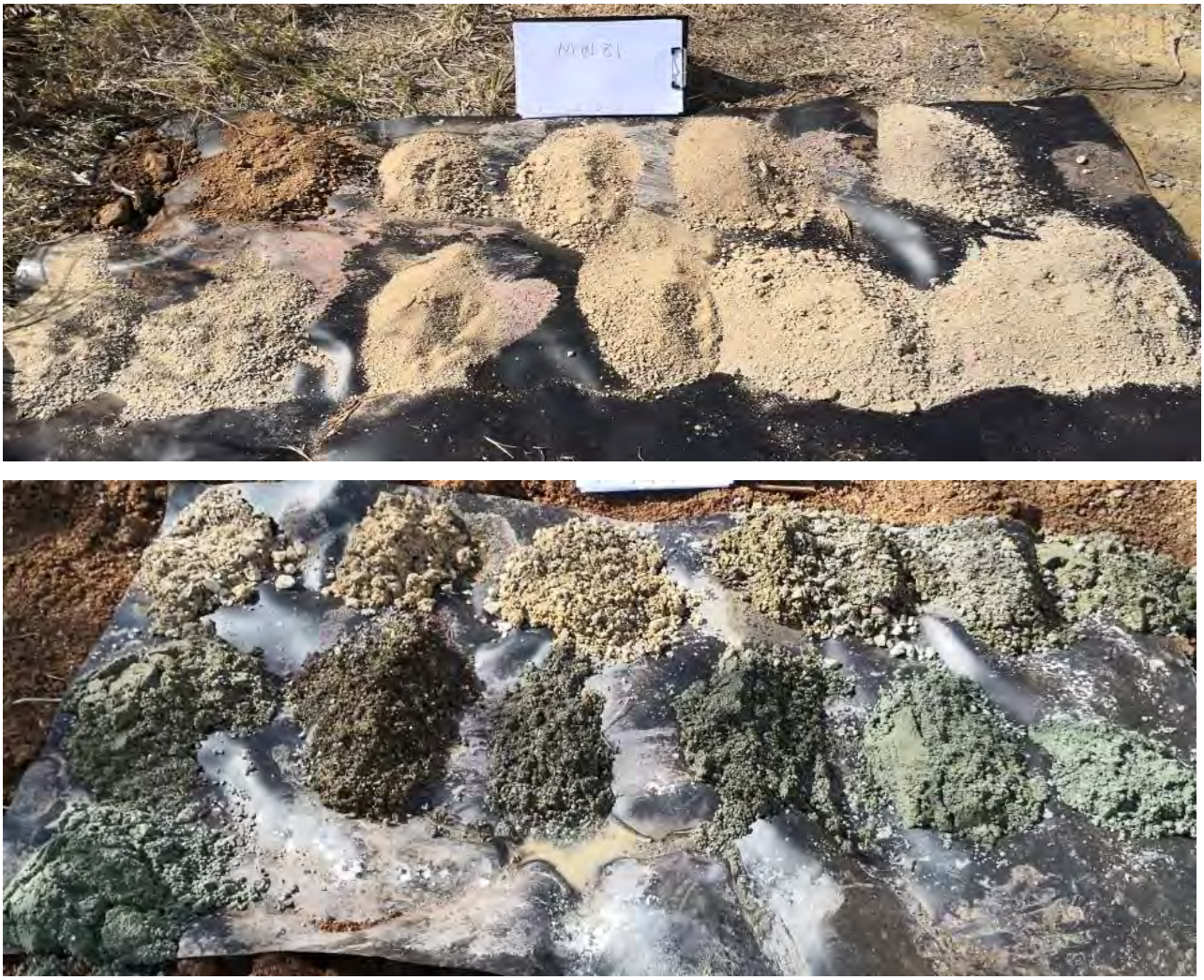


Figure D.1 Bore MW81 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW81
Easting / Northing	
Start date	12-7-23
Finish date	20-7-23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		NA
	Install casing and the ~~attached~~ tremie line		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	B.A. Llewellyn
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
TREMIE NOT REQUIRED
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW82

SHEET 1 OF 3

Position : 258241.4 E 7304075.3 N MGA94 56 **Surface RL:** 208.50m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 13/7/2023 **Date Completed :** 13/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	205mm Rotary Air with Blade Bit	None			0.20 (208.30)		CH	FILL, Silty CLAY, red-brown, with coarse-grained roadbase gravel and natural reworked residual soils	D	St	Samples: MW82_DC_0.0-25.0 (FD06_DC & FS06_DC) MW82_SS_0.35-0.45 (FD01_SS & FS01_SS)		Casing stickup 0.519m
									D	St			
								Silty CLAY, red-brown, residual soils From 0.5m, highly weathered green-grey rock inclusions (5-25mm)	D				
1													
2								From 2.0m, brown, trace labile fine-grained sand	D				
					2.50 (206.00)		ML	Sandy SILT, yellow-brown, fine-grained labile sand, residual soils, with completely to highly weathered rock fragments	D	St			Cement grout 3% bentonite
3					3.60 (204.90)			BRECCIA, yellow-brown, green-grey, white flecks, low strength, highly weathered	D				
4													
5													150mm diameter Class 9 PCV casing
6	205mm Air Hammer	None											
7													
8			GWE at 8.5m Temp WL 8.6m						W		Water stike at 8.5m Temporary borehole water level after drilling 8.6mBGL		
9					9.00 (199.50)			BRECCIA, green-grey, brown and white flecks, low to medium strength, distinctly weathered	W				
10					10.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW82

SHEET 2 OF 3

Position : 258241.4 E 7304075.3 N MGA94 56	**Surface RL:** 208.50m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 13/7/2023	**Date Completed :** 13/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	205mm Air Hammer	None			(198.50)			BRECCIA, green-grey, brown and white flecks, medium- to coarse-grained, distinctly weathered	W				Cement grout 3% bentonite
12											At 12.5m, flow of 3.6L/s		150mm diameter Class 9 PCV casing
13								After 13.0m, green-grey, white and pink flecks, with iron staining					
14													Bentinite seal
15													
16								After 15.6m, increased iron staining, minor quartz inclusions					Filter pack 5mm gravel
17													
18					18.40						At 18.0m, water flow of 7.9L/s		Top of screen at 18.0m
19					(190.10)			ANDESITE, dark grey and green-grey, fine grained, medium strength, slightly weathered	W				150mm diameter stainless steel screen 1mm slot
20													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW82

SHEET 3 OF 3

Position : 258241.4 E 7304075.3 N MGA94 56 **Surface RL:** 208.50m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 13/7/2023 **Date Completed :** 13/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	205mm Air Hammer	None						Continued. ANDESITE, dark grey and green-grey, fine grained, medium strength, slightly weathered	W W		At 21.0m, flow of 10L/s		
22													150mm diameter stainless steel screen 1mm slot
23													
24					23.80 (184.70)			SHALE, dark green-grey, low strength, moderately weathered	W		At 24.0m, flow of approx. 15L/s		Base of screen at 24.0m Backfill with filter pack 5mm gravel
25					25.00 (183.50)			End of borehole at 25.00 metres. Target Depth					
26													
27													
28													
29													
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270



Figure D.2 Bore MW82 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW82
Easting / Northing	
Start date	13.7.23
Finish date	20.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		NA
	Install casing and the attached ~~tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		
	Install head works		
	Head works observed to be installed		
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		
Completion	Bore successfully completed. Suitable for intended purpose		

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	B. d. Llewellyn
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
NO TREMIE REQUIRED
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW83

SHEET 1 OF 4

Position : 257998.1 E 7303887.7 N MGA94 56 | **Surface RL:** 197.70m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 14/7/2023 | **Date Completed :** 14/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL								WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	205mm Rotary Air with Blade Bit	None	GWE at 9.0m		0.40 (197.30)		CH	FILL, Silty CLAY, red-brown, reworked natural residual soils	D	St	Samples: MW83_SS_0.20-0.25 MW83_SS_0.50-0.55 MW83_WB_14.0-19.0 MW83_DC_0.0-37.0		Casing stickup 0.499m
							CH	FILL, Silty CLAY, red-brown, reworked natural residual soils, with COBBLES, green-grey	D	St			
1					1.00 (196.70)		CH	Silty CLAY, dark red-brown, residual soils	D	St			
2								From 2.4m, higly weathered rock inclusions, yellow-brown					
3													Cement grout 3% bentonite
4					4.20 (193.50)			Silty SAND, yellow-brown, fine-grained sub-labile sand, with fine to coarse-sized gravel, grey breccia, completely weathered residual soils	D				
5													150mm diameter Class 9 PVC casing
6					5.40 (192.30)			BRECCIA, dark grey, with green-grey and pale yellow-brown flecks, coarse-grained, highly weathered	D				
7													
8					8.40 (189.30)			ANDESITE, green-grey, with dark grey and pale yellow-brown flecks, medium strength	D				
9									W		Groundwater strike at 9.0m		
10													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW83

SHEET 2 OF 4

Position : 257998.1 E 7303887.7 N MGA94 56 | **Surface RL:** 197.70m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 14/7/2023 | **Date Completed :** 14/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	205mm Air Hammer	None						Continued. ANDESITE, green-grey, with dark grey and pale yellow-brown flecks, medium strength	D W				Cement grout 3% bentonite
12													150mm diameter Class 9 PVC casing
13								From 13.0m, dark green-grey with yellow-brown and pale yellow-brown flecks			At 13.0m, flow of 0.65L/s		
14					14.00 (183.70)			ANDESITE, dark green-grey, high strength, slightly weathered	W		At 14.0m, hard drilling, slight flow increase		Bentonite seal
15													
16													Filter pack 5mm gravel
17													Top of screen at 17.0m
18													150mm diameter stainless steel casing 1mm slots
19					19.20 (178.50)			ANDESITE, dark green-grey, with red-brown and yellow-brown inclusions, minor quartz, very high strength, slightly weathered	W		At 19.0m, flow of 0.7 L/s		
20													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW83

SHEET 3 OF 4

Position : 257998.1 E 7303887.7 N MGA94 56 | **Surface RL:** 197.70m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 14/7/2023 | **Date Completed :** 14/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	205mm Air Hammer	None						Continued. ANDESITE, dark green-grey, with red-brown and yellow-brown inclusions, minor quartz, very high strength, slightly weathered	W W				
					21.60 (176.10)			ANDESITE, dark grey, minor brown inclusions, trace quartz inclusions, very high strength	W				
22													150mm diameter stainless steel casing 1mm slots
23													Base of screen at 23.0m
24													
25											At 25.0m, flow of 0.7 L/s		Backfill with filter pack 5mm gravel
26													
27													
28													
29													
30					30.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW83

SHEET 4 OF 4

Position : 257998.1 E 7303887.7 N MGA94 56 | **Surface RL:** 197.70m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 14/7/2023 | **Date Completed :** 14/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31	205mm Air Hammer	None			(167.70)			ANDESITE, dark green-grey, minor red-brown inclusions, trace quartz inclusions, slightly weathered to fresh, very high strength	W		At 31.0m, flow of 0.7 L/s		
32													
33													Backfill with filter pack 5mm gravel
34													
35													
36													
37					37.00 (160.70)			End of borehole at 37.00 metres. Target Depth					
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270



Figure D.3 Bore MW83 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW83
Easting / Northing	
Start date	14.7.23
Finish date	20.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		
	Install casing and the ~~attached tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	B. A Llewellyn
Drilling Subcontractor	TRD	Driller	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED AS ASKED NOT AS WANTED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW84

SHEET 1 OF 5

Position : 258370.4 E 7304141.7 N MGA94 56	**Surface RL:** 212.60m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 11/7/2023	**Date Completed :** 11/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0							CH	Silty CLAY, red-brown, minor fine-grained sub-labile sand, residual soils	M	St	Samples: MW84_SS_0.10-0.20 MW84_DC_0.0-39.0		Casing stickup 0.67m
1					1.80 (210.80)		CL	Sandy CLAY, brown-red, fine-grained labile sand, residual soils	D	VSt			
2													
3													Cement grout 3% bentonite
4	100mm Rotary Air with Blade Bit				4.00 (208.60)			SILTSTONE, grey-geen, medium strength, moderately-highly weathered	D		Possibly Tertiary siltstone-shale		
5		None						From 5.0m, pale yellow-brown calcareous inclusions					50mm diameter Class 18 PVC casing
6			▽ Temp WL 5.6m					After 6.0m, grades to low-medium strength			Temporary borehole water level after drilling 5.6mBGL		
7													
8					8.00 (204.60)			ANDESITE, purple, with green-grey, low strength, highly weathered	W				
9													Bentonite seal
10													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW84

SHEET 2 OF 5

Position : 258370.4 E 7304141.7 N MGA94 56	**Surface RL:** 212.60m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 11/7/2023	**Date Completed :** 11/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Rotary Air with Blade Bit	None	GWE at 11.0m					Continued. ANDESITE, purple, with green-grey, low strength, highly weathered	W D		At 11.0m, flow of 1.0L/s Water strike at 11.0mBGL		Filter pack 3mm gravel
12													Top of screen at 12.0m
13													
14													
15											At 15.0m, flow of 1.25L/s		50mm diameter Class 18 machine slotted screen 0.5mm slots
					15.40 (197.20)			ANDESITE, dark grey, with quartz, high-very high strength, moderately weathered					
16													
17													
18					18.00 (194.60)			SHALE, green-grey, with brown, low strength, highly weathered					End Cap Base of screen at 18.0m
													Backfill with filter pack 3mm gravel
19													Bentonite seal
20													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW84

SHEET 3 OF 5

Position : 258370.4 E 7304141.7 N MGA94 56 **Surface RL:** 212.60m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 11/7/2023 **Date Completed :** 11/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	100mm Rotary Air with Blade Bit	None						Continued. SHALE, green-grey, with brown, low strength, highly weathered	W				
22													
23					23.00 (189.60)			SHALE, green-grey, low strength, moderately weathered					
24													
25					25.00 (187.60)			ANDESITE, purple, low strength, highly weathered					← Backfill with filter pack 3mm gravel
26													
27													
28					27.80 (184.80)			SHALE, green-grey, low stength, moderately-slightly weathered					
29													
30					30.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW84

SHEET 4 OF 5

Position : 258370.4 E 7304141.7 N MGA94 56 **Surface RL:** 212.60m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 11/7/2023 **Date Completed :** 11/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31					(182.60)			SHALE, slightly weathered, green-grey and brown					
32													
33													
34	100mm Rotary Air with Blade Bit	None											
35													← Backfill with filter pack 3mm gravel
36													
37													
38													
39													
40					40.00			End of borehole at 40.00 metres. Target Depth					

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy

Project : Callide Groundwater Bore Drilling Project

Location : On site, Callide B Power Station

HOLE No. MW84

SHEET 5 OF 5

Position : 258370.4 E 7304141.7 N MGA94 56 **Surface RL:** 212.60m AHD **Angle from Horiz. :** 90° **Processed :** FM

Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP

Date Started : 11/7/2023 **Date Completed :** 11/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
					(172.60)						At 40.0m, flow of 1.25 L/s		

41 42 43 44 45 46 47 48 49 50

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270



Figure D.4 Bore MW84 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW84
Easting / Northing	
Start date	MW84 11.7.23
Finish date	20.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		BL
	Suitable for drilling and construction	MW	
Assignment of licensed water bore driller	Licensed water bore driller present on site	MW	
	Water bore licence sighted by GHD		BL Qld. Class 1
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site	MW	
	GHD completed a checklist on construction materials		BL
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		BL
	Correct casing is at the drilling location and is laid out	MW	
	GHD confirmation correct casing is on-site		BL
	Field test for hydration of bentonite pellets		BL
	Measure and record the casing lengths		BL
	Mark the casing length for the location of the tremie pipe		BL. NA
	Install casing and the attached tremie line	MW	
Installation of annulus materials	Install gravel pack and measure the installation depth	MW	
	Install the bentonite seal and measure the installation depth	MW	
	Allow the bentonite seal to hydrate	MW	

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL.
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL.
	Install head works		
	Head works observed to be installed		BL.
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL.
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL.
Completion	Bore successfully completed. Suitable for intended purpose		BL.

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED ASNZS ASNZS

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW85

SHEET 1 OF 5

Position : 258045.2 E 7303790.1 N MGA94 56 **Surface RL:** 196.26m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 19/7/2023 **Date Completed :** 19/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	205mm Rotary Air with Blade Bit	None			0.30 (195.96)		CL	Sandy CLAY, red-brown and yellow-brown, fine-grained sand, residual soils	D	St	Samples: MW85_SS_0.15-0.20 MW85_SS_0.35-0.40 MW85_WB_25.0-34.0 MW85_DC_0.0-40.0		Casing stickup 0.712mm
							CH	Silty CLAY, red-brown, residual soils	D	St			
1					1.10 (195.16)			ANDESITE, green-grey, with red-brown iron staining, medium strength, distinctly weathered	D				
2													150mm diameter Class 9 PVC casing
3													Cement grout 3% bentonite
4													Bentonite seal
5									SM				
6											Temporary borehole water level after drillling 5.8mBGL at 14:15 on 19/07/2023 Temporary borehole water level after drillling 6.1mBGL at 14:00 on 19/07/2023		
7	205mm Air Hammer	None	▽ Temp WL 7.3m										Filter pack 5mm gravel
8											Temporary borehole water level after drillling 7.3mBGL at 13:50 19/07/2023		
9			▶ GWE at 9.0m						M				
10													Top of screen at 9.5m 150mm diameter stainless steel casing 1mm slots

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW85

SHEET 2 OF 5

Position : 258045.2 E 7303790.1 N MGA94 56 | **Surface RL:** 196.26m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 19/7/2023 | **Date Completed :** 19/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	205mm Air Hammer	None						Continued. ANDESITE, green-grey, with red-brown iron staining, medium strength, distinctly weathered	D M		Inflow into borehole viewed on downhole camera at 10.0m depth after drilling completed		
12													150mm diameter stainless steel casing 1mm slots
13													
14													
15													Base of screen at 15.5m
16					16.40 (179.86)			ANDESITE, green-grey, with brown iron staining, trace quartz incusions, medium strength, moderately weathered	W				
17													
18													Backfill with filter pack 5mm
19											Samples moist. No flow at collar		
20					20.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW85

SHEET 3 OF 5

Position : 258045.2 E 7303790.1 N MGA94 56 | **Surface RL:** 196.26m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 19/7/2023 | **Date Completed :** 19/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	205mm Air Hammer	None			(176.26)			ANDESITE, green-grey, trace iron staining, trace quartz, medium strength, slightly-moderately weathered	W				
22													
23													
24											From 24.0 to 25.0m, flow at collar		
25													← Backfill with filter pack 5mm
26								From 26.2m, grades to green-grey and purple, trace of quartz, medium strength			At 26.0m, no flow at collar while driling At 26.5m, flow of 0.1L/s air only		
27													
28								From 28.0m, grades to green-grey, trace quartz, medium strength					
29													
30					30.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW85

SHEET 4 OF 5

Position : 258045.2 E 7303790.1 N MGA94 56 | **Surface RL:** 196.26m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 19/7/2023 | **Date Completed :** 19/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31	205mm Air Hammer	None			(166.26)			ANDESITE, green-grey, trace quartz, medium strength, slightly-moderately weathered	W		At 30.0m, flow of 0.2L/s air only		
32													
33													
34													
35													← Backfill with filter pack 5mm
36								From 35.8m, grades to green-grey and purple, with quartz inclusions, medium strength					
37											At 37.0m, flow of 0.2L/s		
38													
39													
40					40.00			End of borehole at 40.00 metres. Target Depth			At 40.0m, flow of 0.25L/s measured		

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy

Project : Callide Groundwater Bore Drilling Project

Location : On site, Callide B Power Station

HOLE No. MW85

SHEET 5 OF 5

Position : 258045.2 E 7303790.1 N MGA94 56	**Surface RL:** 196.26m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 19/7/2023	**Date Completed :** 19/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	**Description** [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	**Comments/ Observations**	WELL MONITOR Log	**Components**
					(156.26)								
41													
42													
43													
44													
45													
46													
47													
48													
49													
50													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12609270



Figure D.5 Bore MW85 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW85
Easting / Northing	
Start date	19.7.23
Finish date	20.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		NA Lowered
	Install casing and the ~~attached~~ tremie line		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL.
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL.
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL.
	Install head works		
	Head works observed to be installed		BL.
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL.
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		Minimal flow Not Tested.
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B. Llewellyn		
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes Bore constructed as asked

Notes
On completion of drilling to 40m it was noticed that water was flowing into the bore. JAB (Tony) used portable bore camera to locate water entering the bore at 10m depth.
Decided to cover this depth with screen of 9.5m to 15.5m
Development problems due to air pushing the low flow back into formation with minimal to no flow at collar.
Suggest develop with small pump

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW86

SHEET 1 OF 4

Position : 257074.3 E 7303520.5 N MGA94 56 **Surface RL:** 197.51m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 18/7/2023 **Date Completed :** 18/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	100mm Rotary Air with Blade Bit	None	GNE		0.40 (197.11)		CH	Silty CLAY, red-brown, rock floaters, residual soils	D	St	No water encountered - DRY - Sampling each 6m to reduce working in dust as requested by CS energy Samples: MW86_SS_0.20-0.25 MW86_SS_0.40-0.45 MW86_WB_9.0-15.0 MW86_DC_0.0-37.0		Casing stickup 0.695m
1							CL	Silty CLAY, pale grey-brown and yellow, completely weathered rock, residual soils From 1.2m, grades to yellow-brown, completely weathered siltstone	D				
2					2.40 (195.11)			SILTSTONE, yellow-brown, low strength, highly weathered	D				Cement grout 3% bentonite
3													50mm diameter Class 18 PVC casing
4													
5													
6													Bentonite seal
7													
8					8.00 (189.51)			ANDESITE, pale green-grey, medium strength, highly weathered	D				Filter pack 3mm gravel
9													Top of screen at 9.0m
10					10.00								50mm diameter Class 18 PVC casing

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW86

SHEET 2 OF 4

Position : 257074.3 E 7303520.5 N MGA94 56 | **Surface RL:** 197.51m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 18/7/2023 | **Date Completed :** 18/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Air Hammer	None	GNE		(187.51)			ANDESITE, pale green-grey and grey-brown, medium strength, highly weathered	D				
12								From 12.0m, grades to moderately weathered, green-grey					50mm diameter Class 18 PVC casing
13													
14													
15													Base of screen at 15.0m
16													Filter pack 3mm gravel
17													Bentonite seal
18													Backfill with filter pack 3mm gravel
19													
20					20.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW86

SHEET 3 OF 4

Position : 257074.3 E 7303520.5 N MGA94 56 | **Surface RL:** 197.51m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 18/7/2023 | **Date Completed :** 18/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	100mm Air Hammer	None	GNE		(177.51)			ANDESITE, green-grey, medium strength, moderately weathered	D				
22													
23													
24													
25													← Backfill with filter pack 3mm gravel
26					26.00 (171.51)			SHALE, dark purple-brown, trace quartz, medium strength, moderately weathered	D				
27											From 27.0m, possibly iron alteration andesite?		
28													
29													
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW86

SHEET 4 OF 4

Position : 257074.3 E 7303520.5 N MGA94 56 | **Surface RL:** 197.51m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 18/7/2023 | **Date Completed :** 18/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31	100mm Air Hammer	None	GNE					Continued. SHALE, dark purple-brown, trace quartz, medium strength, moderately weathered	D W				Backfill with filter pack 3mm gravel
32													
33													
34													
35													
36													
37					37.00 (160.51)			End of borehole at 37.00 metres. Target Depth					
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270



Figure D.6 Bore MW86 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW86
Easting / Northing	
Start date	18.7.26
Finish date	20.7.26

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		—
	Install casing and the attached tremie line		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B. Llewellyn	Supervisor	B. Llewellyn
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW89

SHEET 1 OF 2

Position : 258023.9 E 7303642.9 N MGA94 56 | **Surface RL:** 191.54m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 21/7/2023 | **Date Completed :** 21/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	100mm Rotary Air with Blade Bit	None			0.20 (191.34)		CL	Sandy CLAY, brown, fine-grained sand, residual soils	D	F	Samples: MW89_SS_0.20-0.25 MW89_SS_0.50-0.55 MW89_WB_5.0-11.0 MW89_DC_0.0-12.5		Casing stickup 0.657m
							CH	Silty CLAY, dark grey-brown, residual soils	D	St			
1					1.00 (190.54)		CL	Silty CLAY, dark yellow-brown, residual soils	D	St			Cement grout 3% bentonite
2					2.00 (189.54)		CH	Silty CLAY, dark brown, quartzite inclusions, residual soils	D	VSt			50mm diameter Class 18 PVC casing
3					3.00 (188.54)		CH	Silty CLAY, dark red-brown, trace of labile fine-grained sand, residual soils	D	VSt			Bentonite seal
4					4.00 (187.54)			SHALE, purple-grey, distinctly weathered	M		From 4.2m, Tuff?, fine-grained		Filter pack 3mm gravel
5													Top of screen at 5.0m
6			Temp WL 6.28m Moist						M		Temporary water level in borehole 1 hour after drilling 6.28mBGL Moisture between 6.5 to 7.0m, water strike		
7	100mm Air Hammer	None						From 7.2m, grades to medium strength					
8													50mm diameter Class 18 PVC screen 0.5mm slots
9													
10													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW89

SHEET 2 OF 2

Position : 258023.9 E 7303642.9 N MGA94 56 **Surface RL:** 191.54m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 21/7/2023 **Date Completed :** 21/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Air Hammer	None						Continued. SHALE, purple-grey, distinctly weathered	M				50mm diameter Class 18 PVC screen 0.5mm slots End Cap Base of screen at 11.0m
12					12.50 (179.04)			End of borehole at 12.50 metres. Target Depth			Blew water from hole after 10 minutes recovery without running air		Backfill with filter pack 3mm gravel
13													
14													
15													
16													
17													
18													
19													
20													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270



Figure D.7 Bore MW89 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW89
Easting / Northing	
Start date	21.7.23
Finish date	

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	~~Complete cementing of the pre-collar casing~~		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		—
	Install casing and the ~~attached tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	BL Headlyn	Supervisor	B.L Headlyn
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW90

SHEET 1 OF 4

Position : 258012.3 E 7303617.4 N MGA94 56 | **Surface RL:** 190.48m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 27/7/2023 | **Date Completed :** 27/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0							CL	Sandy CLAY, dark grey-brown, fine-grained sand, residual soils with cobbles	D	St	Samples: MW90_SS_0.10-0.20 MW90_SS_0.40-0.50 MW90_WB_0.0-31.0 MW90_DC_0.0-31.0		Casing stickup 0.636m
1	205mm Rotary Air with Blade Bit	None			1.00 (189.48)		CL	Silty CLAY, brown, residual soils	D	St			
2					2.40 (188.08)		CH	Silty CLAY, red-brown, trace fine-grained labile sand, residual soils with highly to completely weathered rock inclusions	D	St			
3													Cement grout 3% bentonite
4													
5								From 5.0m, grades to dark yellow-brown					150mm diameter Class 9 PVC casing
6													
7									M		At 7.0m, Clay grading to moist		Bentonite seal
8	205mm Air Hammer	None	GWE 8.0m		8.00 (182.48)			ANDESITE, purple, trace quartz, medium-high strength, distinctly weathered	W		At 8.0m, water strike		
9													Filter pack 5mm gravel
10													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW90

SHEET 2 OF 4

Position : 258012.3 E 7303617.4 N MGA94 56 | **Surface RL:** 190.48m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 27/7/2023 | **Date Completed :** 27/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11								Continued. ANDESITE, purple, trace quartz, medium-high strength, distinctly weathered. After 10m, highly weathered	W		At, 10m, water mist at collar after blowing air into borehole		
12													
13								After 13.0m, grades to purple-brown and dark grey					
14													
	205mm Air Hammer	None			14.80 (175.68)			ANDESITE/SHALE bands, purple, grey and green-grey, medium strength	W				150mm diameter Class 9 PVC casing
15													
16													
17					17.00 (173.48)			SHALE, purple, dark grey and green grey, with Andesite inclusions	W		From 17.0 to 20.m, Altered Andesite?		
18													
19								After 19.0m, minor quartz inclusions					
20					20.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW90

SHEET 3 OF 4

Position : 258012.3 E 7303617.4 N MGA94 56 **Surface RL:** 190.48m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 27/7/2023 **Date Completed :** 27/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	205mm Air Hammer	None			(170.48)			SHALE, dull purple, minor quartz inclusions, low-medium strength, highly weathered	W		From 20.0 to 21.0m, increase in water flow, approx. 0.2L/s From 20.0 to 31.0m, Altered Andesite?		Filter pack 5mm gravel Top of screen at 21.0m
22													
23													
24								After 24.0m, medium strength			At 24.0m, flow approximately 0.2L/s		150mm diameter stainless steel screen 1mm slots
25													
26													
27													Base of screen at 27.0m
28													
29													Backfill with filter pack 5mm gravel
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy

Project : Callide Groundwater Bore Drilling Project

Location : Off site, Callide B Power Station

HOLE No. MW90

SHEET 4 OF 4

Position : 258012.3 E 7303617.4 N MGA94 56 **Surface RL:** 190.48m AHD **Angle from Horiz. :** 90° **Processed :** FM

Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP

Date Started : 27/7/2023 **Date Completed :** 27/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31		None						Continued. SHALE, dull purple, minor quartz inclusions, low-medium strength, highly weathered	W				Backfill with filter pack 5mm gravel
					31.00 (159.48)			End of borehole at 31.00 metres. Target Depth					
32													
33													
34													
35													
36													
37													
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12609270



Figure D.8 Bore MW90 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW90
Easting / Northing	
Start date	28.7.23
Finish date	28.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		GL.
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		GL.
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		GL.
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		GL.
	Field test for hydration of bentonite pellets		GL.
	Measure and record the casing lengths		GL.
	Mark the casing length for the location of the tremie pipe		NA
	Install casing and the ~~attached tremie~~ line		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL.
	Establish appropriate grout mix ~~and pump grout through tremie line~~	NA	
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL.
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL.
	Install head works	AM	
	Head works observed to be installed		BL.
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL.
	Pits are ready for development water	AM	
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)	AM	
	Bore observed to be developed and field testing of water quality conducted		BL.
Completion	Bore successfully completed. Suitable for intended purpose	AM	BL.

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	B. Llewellyn
Drilling Subcontractor	JAB	Tony N	Licenced Water Bore Driller	AM

Construction notes

Notes
Bore constructed as advised.

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW91

SHEET 1 OF 4

Position : 258097.3 E 7303613.7 N MGA94 56 | **Surface RL:** 193.05m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 26/7/2023 | **Date Completed :** 26/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL								WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0	100mm Rotary Air with Blade Bit	None			0.00 (193.05)		CH	Silty CLAY, red-brown, residual soils	D	St	Samples: MW91_SS_0.15-0.20 MW91_SS_0.45-0.50 MW91_WB_8.0-27.0 MW91_DC_0.0-30.0		Casing stickup 0.726m
					0.60 (192.45)		CL	Sandy CLAY, mottled pale red-brown, residual soils with pale yellow-brown inclusions of completely weathered rock	D	St			
1													
2					2.20 (190.85)			SHALE, purple-brown, medium strength	D		From 2.2 to 3.8m, Altered iron Andesite?		
3													50mm diameter Class 18 PVC casing
4					4.00 (189.05)			ANDESITE, green-grey and yellow-brown, medium strength, distinctly weathered	D				
5													Cement grout 3% bentonite
6								After 6.0m, grades to green-grey and purple					
7	100mm Air Hammer	None											
8								After 8.0m, high strength					
9													
10					10.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW91

SHEET 2 OF 4

Position : 258097.3 E 7303613.7 N MGA94 56 **Surface RL:** 193.05m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 26/7/2023 **Date Completed :** 26/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Air Hammer	None	GWE at 12.0m		(183.05)			ANDESITE, green-grey and speckled pale yellow-brown, high strength, moderately-highly weathered	D				Bentonite seal
12								After 12.0m, green-grey, yellow-brown, pale yellow-brown and white speckled, quartz inclusions, distinctly weathered	W		At 12.0m, water strike, approx. flow of 0.1L/s Between 12.0 and 14.0m, flow increasing to 0.8L/s		Filter pack 3mm gravel Top of screen at 12.1m
13													
14											At 14.0m, flow not increasing, approximately 0.8L/s		
15											At 15.0m, flow measured at 0.8L/s		50mm diameter Class 18 PVC screen 0.5mm slots
16													
17													
18											At 18.0m, flow of 1.5L/s		Base of screen at 18.1m
19													Backfill with filter pack 3mm gravel
20					20.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : Off site, Callide B Power Station

HOLE No. MW91

SHEET 3 OF 4

Position : 258097.3 E 7303613.7 N MGA94 56 | **Surface RL:** 193.05m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 26/7/2023 | **Date Completed :** 26/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	100mm Air Hammer	None			(173.05)			ANDESITE, dark green-grey, trace quartz, high strength, moderately-slightly weathered	W				Backfill with bentonite
22													
23													
24													
25													Backfill with filter pack 3mm gravel
26								After 26.0m, grades to pale green-grey, trace quartz, high strength					
27								After 27.2m, grades to dark green-grey, trace quartz, high strength					
28													
29											At 30.0m, flow of 2.0L/s		
30					30.00			End of borehole at 30.00 metres. Target Depth					

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy

Project : Callide Groundwater Bore Drilling Project

Location : Off site, Callide B Power Station

HOLE No. MW91

Position : 258097.3 E 7303613.7 N MGA94 56 **Surface RL:** 193.05m AHD **Angle from Horiz. :** 90° **Processed :** FM

Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP

Date Started : 26/7/2023 **Date Completed :** 26/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
					(163.05)								
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270



Figure D.9 Bore MW91 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW91
Easting / Northing	
Start date	26.7.23
Finish date	

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		NA
	Install casing ~~and the attached tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~	~~JAB~~	
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works	TW	
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water	TW	
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)	TW	
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose	TW	BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative	~~JAB~~	~~Contact~~		
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	B. a Llewellyn
Drilling Subcontractor	JAB	TONY / W	Licenced Water Bore Driller	TW

Construction notes

Notes
~~TREMIE~~ NOT REQUIRED
NO PRECOLLAR CASING REQUIRED
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW94

SHEET 1 OF 3

Position : 257792.6 E 7303623.3 N MGA94 56 | **Surface RL:** 193.81m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 15/7/2023 | **Date Completed :** 15/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
0							CH	Silty CLAY, red-brown, residual soils	D	St	Samples: MW94_SS_0.30-0.35 MW94_SS_0.50-0.55 MW94_WB_19.0-25.0 MW94_DC_0.0-25.0		Casing stickup 0.519m
					0.40 (193.41)		CH	Silty CLAY, grey, completely weathered shale (residual soils)	D	St			
1					1.00 (192.81)			SHALE, grey, green-grey limonite inclusions, trace carbonaceous inclusions, low-medium strength	D				
2	100mm Rotary Air with Blade Bit	None											
3								From 2.6m, dull purple-grey, black carbonaceous inclusions, medium strength					Cement grout 3% bentonite
4													
5													50mm diameter Class 18 PVC casing
6								From 6.0m, plae green-grey, no carbonaceous inclusions, medium strength					
7	100mm Air Hammer	None						From 7.2m, dull purple-grey, low strength					
8								From 8.0m, pale green-grey					
9								From 9.4m, dull purple-grey					
10					10.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No. 12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW94

SHEET 2 OF 3

Position : 257792.6 E 7303623.3 N MGA94 56	**Surface RL:** 193.81m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 15/7/2023	**Date Completed :** 15/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Air Hammer	None	GWE at 19.0m		(183.81)			SHALE, dull purple-grey, low-medium strength, distinctly weathered	D				
					11.40 (182.41)			ANDESITE, green-grey, high strength, slightly weathered	D		Fine-grained TUFF?		Cement grout 3% bentonite
12													
13													
14													
15													50mm diameter Class 18 PVC casing
16													
17													Bentonite seal
18								From 18.2m, green-grey, trace yellow-brown and pale yellow-brown limonite? inclusions					Filter pack 3mm gravel
19									W		At 19.0m, water strike, approx. flow of 0.2L/s		Top of screen at 19.0m
													50mm diameter Class 18 PVC screen 0.5mm slots
20					20.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW94

SHEET 3 OF 3

Position : 257792.6 E 7303623.3 N MGA94 56 | **Surface RL:** 193.81m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 15/7/2023 | **Date Completed :** 15/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	100mm Air Hammer	None			(173.81)			TUFF, green-grey, fine-grained, slightly weathered	W		At 20.0m, approx. flow of 0.5L/s		
					20.80 (173.01)			SHALE, dark purple-grey, low strength, distinctly weathered	W				
22													Filter pack 3mm gravel
23													50mm diameter Class 18 PVC screen 0.5mm slots
24													
25					25.00 (168.81)			End of borehole at 25.00 metres. Target Depth			At 25.0m, flow of 1.4L/s		End Cap Base of screen at 25.0m
26													
27													
28													
29													
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270



Figure D.10 Bore MW94 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW 94
Easting / Northing	
Start date	15.7.23
Finish date	20.7.23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		
	Field test for hydration of bentonite pellets		
	Measure and record the casing lengths		
	Mark the casing length for the location of the tremie pipe		NA
	Install casing and ~~the attached tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B Llewellyn	Supervisor	BL
Drilling Subcontractor	JAB	Tony W	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED AS ASKED NOT AS DIRECTED

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW98

SHEET 1 OF 4

Position : 256822.5 E 7303493.7 N MGA94 56	**Surface RL:** 189.42m AHD	**Angle from Horiz. :** 90°	**Processed :** FM
Rig Type : Investigator	**Mounting:** Truck	**Contractor :** JAB Drilling	**Driller :** Tony Watkinson	**Checked :** MP
Date Started : 18/7/2023	**Date Completed :** 18/7/2023	**Logged by :** BL	**Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
1	100mm Rotary Air with Blade Bit	None	GNE				CH	Sandy CLAY, dark red-brown, residual soils with rock fragments	D	St	Samples: MW98_SS_0.25-0.30 MW98_SS_0.45-0.50 MW98_WB_6.0-12.0 MW98_DC_0.0-31.0		Casing stickup 0.579m
					1.20 (188.22)		CH	Silty CLAY, red-brown, residual soils	D	St			Cement grout 3% bentonite
2								From 2.0m, grades to brown, trace inclusions			No groundwater detected during drilling		Bentonite seal
3					3.20 (186.22)			SHALE, dark red-brown, low strength, distinctly weathered	D				
4													
5								From 4.8m, grades to red-brown and grey, low-medium strength					50mm diameter Class 18 PVC casing
6													
7													
8	100mm Air Hammer	None											Filter pack 3mm gravel
9													
10					10.00								

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW98

SHEET 2 OF 4

Position : 256822.5 E 7303493.7 N MGA94 56 **Surface RL:** 189.42m AHD **Angle from Horiz. :** 90° **Processed :** FM
Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP
Date Started : 18/7/2023 **Date Completed :** 18/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
11	100mm Air Hammer	None	GNE		(179.42)			SHALE, red-brown and grey, low-medium strength, slightly-moderately weathered	D		From 10.0m, hard drilling		Filter pack 3mm gravel
12													Top of screen at 12.0m
13													
14													
15													50mm diameter Class 18 PVC screen 0.5mm slots
16													
17													
18													End Cap Base of screen at 18.0m
													Backfill with filter pack 3mm gravel
19													
20													Backfill with bentonite

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy
Project : Callide Groundwater Bore Drilling Project
Location : On site, Callide B Power Station

HOLE No. MW98

SHEET 3 OF 4

Position : 256822.5 E 7303493.7 N MGA94 56 | **Surface RL:** 189.42m AHD | **Angle from Horiz. :** 90° | **Processed :** FM
Rig Type : Investigator | **Mounting:** Truck | **Contractor :** JAB Drilling | **Driller :** Tony Watkinson | **Checked :** MP
Date Started : 18/7/2023 | **Date Completed :** 18/7/2023 | **Logged by :** BL | **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
21	100mm Air Hammer	None	GNE					Continued. SHALE, red-brown and grey, low-medium strength, slightly-moderately weathered	D D				
22								From 22.0m, grades to pale grey					
23								From 23.0m, grades to red-brown and grey					
24													
25													← Backfill with filter pack 3mm gravel
26													
27													
28													
29													
30													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.
12609270

BOREHOLE LOG SHEET WITH WELL MONITOR STANDPIPE PIEZOMETER

GEO_BOREHOLE_AS1726 2017 12609270-BORELOGS.GPJ GHD_GEO_TEMPLATE 2.00.GDT 5/10/23

Client : CS Energy

Project : Callide Groundwater Bore Drilling Project

Location : On site, Callide B Power Station

HOLE No. MW98

SHEET 4 OF 4

Position : 256822.5 E 7303493.7 N MGA94 56 **Surface RL:** 189.42m AHD **Angle from Horiz. :** 90° **Processed :** FM

Rig Type : Investigator **Mounting:** Truck **Contractor :** JAB Drilling **Driller :** Tony Watkinson **Checked :** MP

Date Started : 18/7/2023 **Date Completed :** 18/7/2023 **Logged by :** BL **Date:** 22/08/2023

DRILLING					MATERIAL							WELL MONITOR	
SCALE (m)	Drilling Method	Hole Support \ Casing	Water	Samples & Tests	Depth/(RL) metres	Graphic Log	USC Symbol	Description [FILL/TOPSOIL/COBBLES/BOULDERS/-] SOIL NAME: plasticity / primary particle characteristics, colour, secondary and minor components, zoning (origin) and ROCK NAME: grain size, colour, fabric / texture, inclusions or minor components, durability, strength, weathering / alteration, defects	Moisture Condition	Consistency / Density Index	Comments/ Observations	WELL MONITOR Log	Components
31		None						Continued. SHALE, red-brown and grey, low-medium strength, slightly-moderately weathered	D D				Backfill with filter pack 3mm gravel
					31.00 (158.42)			End of borehole at 31.00 metres. Target Depth					
32													
33													
34													
35													
36													
37													
38													
39													
40													

See standard sheets for details of abbreviations & basis of descriptions

GHD

Job No.

12609270



Figure D.11 Bore MW93 chip samples

Inspection and Testing Plan

Project	**Callide Groundwater Bore Drilling Project**
Project number	**12609270**
Bore ID	MW98
Easting / Northing	
Start date	18-7-23
Finish date	20-7-23

ITP Record – Subcontractor and GHD are to sign at each hold point. Work cannot procedure to the next step without a signature from the responsible party

Task	Hold Point	Responsibility	
		Subcontractor	GHD
Agreement of hole plan	Suitable for monitoring requirements		BL.
	Suitable for drilling and construction		
Assignment of licensed water bore driller	Licensed water bore driller present on site		
	Water bore licence sighted by GHD		BL.
Drilling equipment and construction materials	Subcontractor confirms that all required drilling equipment and bore construction materials are present on site		
	GHD completed a checklist on construction materials		BL.
Installation of pre-collar casing (only if required) NA	Establish and communicate installation depth		
	Correct casing is available at the drilling location		
	GHD confirmation correct casing is on-site		
	Install casing		
	Casing observed to be installed		
	Establish appropriate grout mix		
	Complete cementing of the pre-collar casing		
	Cementing of pre-collar casing observed to be completed		
Installation of casing and screen (completion string)	Establish and communicate installation depth and screen interval		BL.
	Correct casing is at the drilling location and is laid out		
	GHD confirmation correct casing is on-site		BL.
	Field test for hydration of bentonite pellets		BL.
	Measure and record the casing lengths		BL.
	Mark the casing length for the location of the tremie pipe		NA.
	Install casing and the ~~attached tremie line~~		
Installation of annulus materials	Install gravel pack and measure the installation depth		
	Install the bentonite seal and measure the installation depth		
	Allow the bentonite seal to hydrate		

Inspection and Testing Plan

Task	Hold Point	Responsibility	
		Subcontractor	GHD
	GHD supervising hydrogeologist confirms that bentonite has sufficiently hydrated		BL
	Establish appropriate grout mix ~~and pump grout through tremie line~~		
	GHD supervising hydrogeologist confirms that the bore annulus is grouted		BL
Construction of head works	GHD supervising hydrogeologist present on site prior to construction of head works		BL
	Install head works		
	Head works observed to be installed		BL
Bore development	GHD supervising hydrogeologist present on site prior to start of bore development		BL
	Pits are ready for development water		
	Lower air-line (polypipe) to just above the screen level and develop bore (min 1 hour)		
	Bore observed to be developed and field testing of water quality conducted		BL
Completion	Bore successfully completed. Suitable for intended purpose		BL

Acknowledgement of successful bore installation

	Organisation	Person	Role	Acknowledgement - signature
Client Representative				
Supervising Hydrogeologist	GHD	B. Llewellyn	Supervisor	B. Llewellyn
Drilling Subcontractor	JAB	Tom/W	Licenced Water Bore Driller	

Construction notes

Notes
BORE CONSTRUCTED AS ASKED NOT AS ADVISED

Appendix E

Photographic log

MW81 – Recovery bore









Pumping test setup

MW82 – Recovery bore







MW83 – Recovery bore







MW84 – Monitoring bore









Measuring approximate flow from the borehole during drilling

MW85 – Recovery bore







MW86 – Monitoring bore







MW91 – Monitoring bore





MW94 – Monitoring bore







MW98 – Monitoring bore







Appendix F

Bore development records

Bore Development Record

Bore ID: MW81

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.474	**Pre-dev SWL (m bTOC)**	8.6	**Post-dev SWL (m bTOC)**	9.145
Screen interval (m bgl)	16-22	**Water in casing (m)**	13.43	**Date**	3/08/2023
Total bore depth (m bgl)	22.06 m BTOC	**Vol. water in casing (L)**	220	**Time**	16:30
Casing internal diameter (mm)	146	**Development method**	Air Lift		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
14/08/2023 14:30		89.9								Slightly cloudy, no odour
14/08/2023 14:50			7.47		0.044*		6.43	172	24.3	Flow surging
14/08/2023 15:00		95.0	8.01		0.038*		7.14	229.7	23.4	Clean, clear, no odour
14/08/2023 15:15	1.3	92.1	7.74		0.032*		7.6	228	23.9	Clean, clear, no odour
14/08/2023 15:20		93.0	7.96		0.03*		7.62	240	23	Clean, clear, no odour
14/08/2023 15:35	1.3	94.4	8.03		0.024*		7.83	71.1	23.7	
14/08/2023 15:40		94.3	8.04		0.028*		7.64	60.6	23.5	Clean, clear, no odour (Stopped development)
										* NOTE: the EC readings appear to be incorrect, and are therefore not reliable

Bore Development Record

Bore ID: MW82

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.54	**Pre-dev SWL (m bTOC)**	7.82	**Post-dev SWL (m bTOC)**	7.88
Screen interval (m bgl)	18-24	**Water in casing (m)**	15.4	**Date**	5/08/2023
Total bore depth (m bgl)	24.48 m BTOC	**Vol. water in casing (L)**		**Time**	7:40
Casing internal diameter (mm)	146	**Development method**	Air Lift		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
17/07/2023 12:00	5.0									Started development (airlift rate approx. 5 L/s)
17/07/2023 12:10		83.5	7.04		0.0547*		7.93	61.2	23.8	Slight cloudiness, no odour
17/07/2023 12:25	6.0	92.1	7.68		0.026*		7.97	55.6	24.1	Clear, no odour
17/07/2023 12:35		92.1	7.53		0.027*		7.45	132.7	25.2	Clear, no odour. Noted change in redox
17/07/2023 12:50		98.7	8.33		0.038*		8.06	73.6	24.0	Clear, no odour
17/07/2023 13:10		87.1	4.85		0.046*		7.94	66.6	24.0	Clear, no odour
17/07/2023 13:20	6.8	92.7	7.69		0.052*		7.86	67.7	24.5	Clear, no sediment, no odour.
										Stopped developmment at 13:20
										* NOTE: the EC readings appear to be incorrect, and are therefore not reliable

Bore Development Record

Bore ID: MW83

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.5	**Pre-dev SWL (m bTOC)**	5.88	**Post-dev SWL (m bTOC)**	5.9
Screen interval (m bgl)	17-23	**Water in casing (m)**		**Date**	1/08/2023
Total bore depth (m bgl)	22.7 m BTOC	**Vol. water in casing (L)**		**Time**	10:00
Casing internal diameter (mm)	146	**Development method**	Air lifting		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
17/07/2023 13:55										Started development
17/07/2023 14:35	0.13	108.7	8.93		0.052*		8.28	144.2	24.9	Cloudy, suspended solids, no odour
17/07/2023 15:00	0.13	91.2	7.22		0.061*		8.05	225	28.1	Slightly cloudy, suspended solids, no odour
17/07/2023 15:20		99.1	8.35		0.045*		8.15	181.5	24.0	Clearing, no odour
17/07/2023 15:30	0.13	97.5	8.25		0.042*		8.30	172.5	23.8	Slightly cloudy, no odour
										Stopped development at 15:30
										* NOTE: the EC readings appear to be incorrect, and are therefore not reliable

Bore Development Record

Bore ID: MW84

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.68	**Pre-dev SWL (m bTOC)**		**Post-dev SWL (m bTOC)**	6.316
Screen interval (m bgl)	12-18m	**Water in casing (m)**		**Date**	9/08/2023
Total bore depth (m bgl)	18	**Vol. water in casing (L)**		**Time**	7:40
Casing internal diameter (mm)	50	**Development method**	Air lift		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
13/07/2023 14:05	0.74									Started airlifting. Slightly cloudy
13/07/2023 14:15		88.2	6.78		0.41*		6.70	109.2	27.1	Slightly cloudy, no odour
13/07/2023 14:40		98.4	8.02		0.37*		6.16	169.8	25.6	Clear, no sediment, no odour
13/07/2023 14:50		97.7	7.86		0.34*		6.34	166.2	26.4	Clear, no sediment, no odour
13/07/2023 15:00	0.75	96.9	7.91		0.30*		6.27	179.3	25.2	Slight cloudiness, no sediment, no dour
										Stopped development at 15:00
										* NOTE: the EC readings appear to be incorrect, and are therefore not reliable

Bore Development Record

Bore ID: MW85

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.712	**Pre-dev SWL (m bTOC)**	5.66	**Post-dev SWL (m bTOC)**	6.09
Screen interval (m bgl)	9.5-15.5	**Water in casing (m)**	7.7	**Date**	5/08/2023
Total bore depth (m bgl)	13.51 m BTOC	**Vol. water in casing (L)**		**Time**	10:00
Casing internal diameter (mm)	146	**Development method**	Air lift		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
20/07/2023 12:05										Started developing at 12:05. Minimal grey cloudy water returning. Flow during drillling was approx. flow 0.2 L/s. Water was not air lifting from bore, as air was pushing water back into the screen. Bore is not well developed, may need a small pump to remove water.
20/07/2023 12:10	0.01									
20/07/2023 12:30	0.02									

Bore Development Record

Bore ID: MW86

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.695	**Pre-dev SWL (m bTOC)**		**Post-dev SWL (m bTOC)**	DRY
Screen interval (m bgl)	9-15m	**Water in casing (m)**		**Date**	
Total bore depth (m bgl)	15.42 m BTOC	**Vol. water in casing (L)**		**Time**	
Casing internal diameter (mm)	50	**Development method**	Air lifting		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
20/07/2023 14:00										Started airlifting. Only dust returning.

Bore Development Record

Bore ID: MW89

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.86	**Pre-dev SWL (m bTOC)**	7.55	**Post-dev SWL (m bTOC)**	7.520
Screen interval (m bgl)	5-11m	**Water in casing (m)**	4.72	**Date**	11/08/2023
Total bore depth (m bgl)	11.83 m BTOC	**Vol. water in casing (L)**		**Time**	9:00
Casing internal diameter (mm)	50	**Development method**	Air Lift		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
27/07/2023 9:50	0.03									Started development. Water red-brown in colour, suspended solids.
27/07/2023 10:15	0.03	96.0	8.24		0.032*		8.81	69.2	22.8	Pale red-brown in colour, suspended solids, no odour
27/07/2023 10:40	0.03	94.0	8.13		0.035*		7.84	194.3	22.6	Pale red-brown in colour, trace suspended solids, no odour
27/07/2023 10:50	0.03	96.1	8.57		0.037*		7.74	264.1	20.7	Very pale red-brown, trace suspended solids, no odour
27/07/2023 11:00	0.02	95.4	8.33		0.045*		8.37	168	22.2	Very pale red-brown, trace suspended solids, no odour
27/07/2023 11:05										Stopped development at 11:05
										* NOTE: the EC readings appear to be incorrect, and are therefore not reliable

Bore Development Record

Bore ID: MW90

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.636	**Pre-dev SWL (m bTOC)**	5.94	**Post-dev SWL (m bTOC)**	6.67
Screen interval (m bgl)	21-27	**Water in casing (m)**	21.06	**Date**	8/08/2023
Total bore depth (m bgl)	27.6 m BTOC	**Vol. water in casing (L)**		**Time**	12:50
Casing internal diameter (mm)	146	**Development method**	Air lifting		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
28/07/2023 9:00	0.50									Started airlift. Water cloudy brown, suspended solids
28/07/2023 9:20	0.40									Water cleaning up, brown colour, no odour
28/07/2023 9:25	0.30	78.9	6.86		0.03*		8.42	165.2	22.4	Water cleaning up, pale brown colour, no odour
28/07/2023 9:50	0.30	87.9	7.58		0.028*		8.43	172.3	22.6	Water slightly cloudy, pale brown, cleaner, no odour
28/07/2023 10:10	0.30	88.0	7.54		0.043*		8.38	159.3	23.1	Water slighly cloudy, cleaning up, no odour
28/07/2023 10:35	0.3	91.1	7.77		0.057*		8.65	144.1	23.2	Very slightly cloudy, clean (no suspended solids), no odo
28/07/2023 11:00	0.3	95.5	8.18		0.046*		7.84	163.5	22.7	Water clean and clear
										Stopped development at 11:00
										* NOTE: the EC readings appear to be incorrect, and are therefore not reliable

Bore Development Record

Bore ID: MW91

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.726	**Pre-dev SWL (m bTOC)**		**Post-dev SWL (m bTOC)**	9.970
Screen interval (m bgl)	12.1-18.1	**Water in casing (m)**		**Date**	11/08/2023
Total bore depth (m bgl)	18.86 m BTOC	**Vol. water in casing (L)**		**Time**	9:42
Casing internal diameter (mm)	50	**Development method**	Air lift		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
27/07/2023 7:45	0.3									Started airlifting. Cloudy pale yellow-brown, no odour
27/07/2023 8:05	0.3	80.6	7.26		0.026*		8.28	10.7	21.7	Water clear, no odour
27/07/2023 8:20	0.3	101.6	8.67		0.022*		8.24	33.2	23.0	Water clear, no odour
27/07/2023 8:40	0.3	94.8	8.44		0.023*		8.25	131.7	20.8	Water clear, no odour
27/07/2023 8:55	0.3	98.8	8.49		0.025*		8.34	107.3	23.1	Water clear, no odour
27/07/2023 9:10	0.3	101.3	8.52		0.025*		7.44	100.7	23.9	Water clear, no odour
27/07/2023 9:15										Stopped development at 09:15
										* NOTE: the EC readings appear to be incorrect, and are therefore not reliable

Bore Development Record

Bore ID: MW94

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.5	**Pre-dev SWL (m bTOC)**	9.41	**Post-dev SWL (m bTOC)**	9.53
Screen interval (m bgl)	19-25	**Water in casing (m)**		**Date**	5/08/2023
Total bore depth (m bgl)	25	**Vol. water in casing (L)**		**Time**	15:37
Casing internal diameter (mm)	50	**Development method**	Air lift		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
20/07/2023 9:50										Started airlift. Water is cloudy. Flow rate during drilling approx 1.4 L/s
20/07/2023 10:05	1.0	83.0	7.27		0.046*		7.61	137.1	18.4	Cloudy, no odour
20/07/2023 10:20		78.4	6.18		0.053*		7.40	105.2	27.0	Cloudy, no odour
20/07/2023 10:35		97.8	8.05		0.053*		7.68	111.5	24.8	Slighlty cloudy, no odour
20/07/2023 10:50	1.0	105.5	8.46		0.054*		8.03	137.2	25.5	Slighlty cloudy, no odour
20/07/2023 11:00		95.0	7.48		0.051*		8.24	77.3	26.4	Slighlty cloudy, no odour
20/07/2023 11:10	1.0	100.3	7.82		0.079*		8.23	142.2	26.3	Slighlty cloudy, no odour
20/07/2023 11:15		108.2	8.92		0.091*		7.73	337.0	25.1	Water trace cloudy, quite clear
										Stopped development at 11:15
										* NOTE: the EC readings appear to be incorrect, and are therefore not reliable

Bore Development Record

Bore ID: MW98

Project:	**Callide Groundwater Bore Drilling Project**	**Project number:**	**12609270**
Client:	**CS Energy**	**GHD Personnel:**	**Brian Llewellyn**

Bore details		**Pre-development details**		**Post-development water level details**	
Total casing stickup (m agl)	0.58	**Pre-dev SWL (m bTOC)**	10.63	**Post-dev SWL (m bTOC)**	9.46
Screen interval (m bgl)	12-18m	**Water in casing (m)**		**Date**	5/08/2023
Total bore depth (m bgl)	18.455 m BTOC	**Vol. water in casing (L)**		**Time**	14:47
Casing internal diameter (mm)	50	**Development method**	Air lift		

Bore development water quality observations

Date / Time	Yield L/sec	DO %S	DO ppm	SPC @ 25° uS/cm	EC mS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
20/07/2023 14:30	0.15									Start airlifting. Water was grey/brown
20/07/2023 14:40	0.05									Cloudy, pale grey colour, slight suspended solids, no odour
20/07/2023 14:50	0.05	95.0	7.47		0.092*		7.80	172	27.9	Cloudy, pale grey colour, slight suspended solids, no odour
20/07/2023 15:05	0.05	110.8	9.6		0.076*		7.9	219.2	22.1	Cloudy, pale grey colour, slight suspended solids, no odour
										Stopped development at 15:05. Did not fully clean up, as bore yield was very low.
										* NOTE: the EC readings appear to be incorrect, and are therefore not reliable

Appendix G

Bore survey results

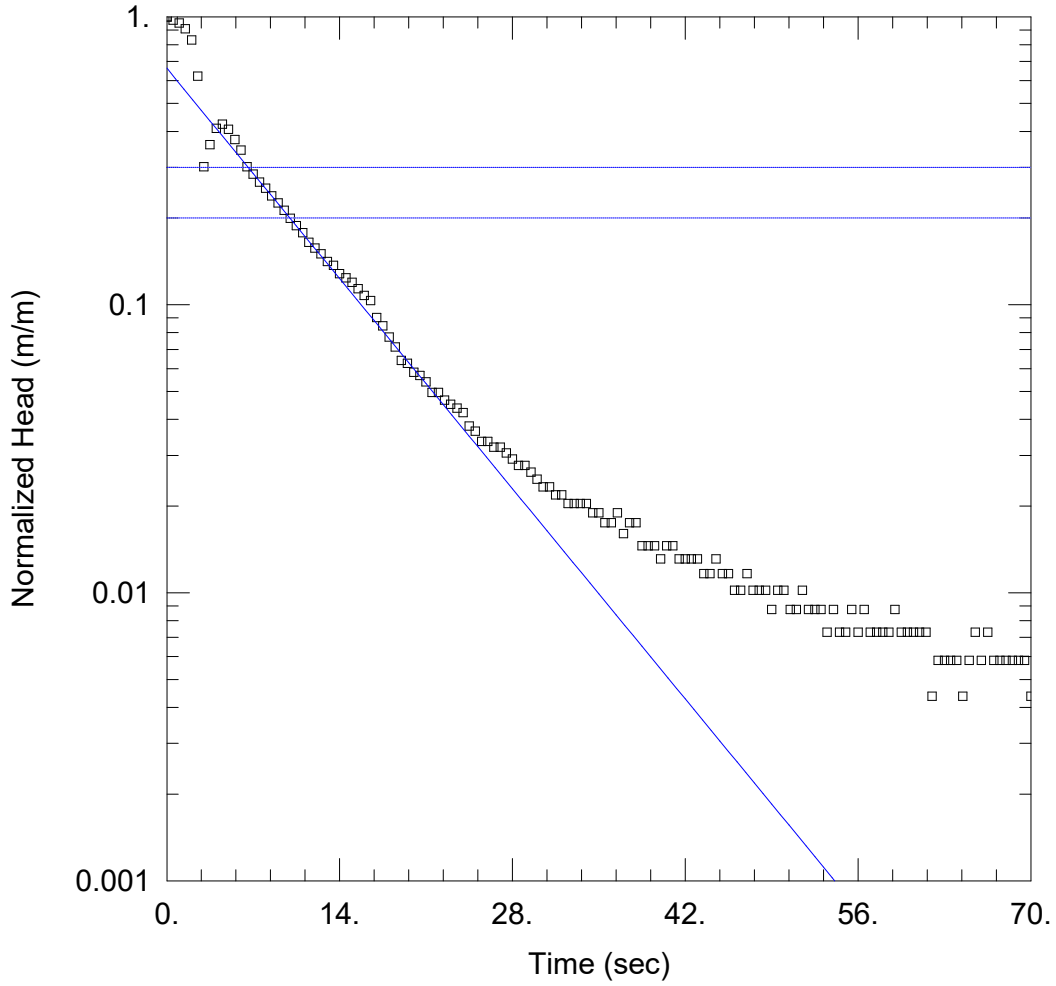
Callide Groundwater Bore Drilling Project

Survey of bores, completed by Fredriksen, Maclean and Associates

MGA94 Zone 56 Grid Borehole Co-ordinates				
Borehole	Easting	Northing	RL (Digital LvL)	Natural Surface Level
MW81	258295.466	7304124.687	210.192	209.707
MW82	258241.432	7304075.328	209.023	208.495
MW83	257998.064	7303887.72	198.21	197.698
MW84	258370.406	7304141.737	213.278	212.598
MW85	258045.167	7303790.073	196.984	196.261
MW86	257074.299	7303520.495	198.203	197.514
MW89	258023.937	7303642.861	192.203	191.542
MW90	258012.324	7303617.432	191.097	190.482
MW91	258097.269	7303613.698	193.772	193.046
MW94	257792.558	7303623.283	194.311	193.811
MW98	256822.495	7303493.653	190.004	189.422

Appendix H

Slug testing analysis



WELL TEST ANALYSIS

Data Set: C:\...\MW84_Test_1_fal_V2.aqt
Date: 08/21/23 Time: 08:49:06

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW84
Test Date: 9/08/23

AQUIFER DATA

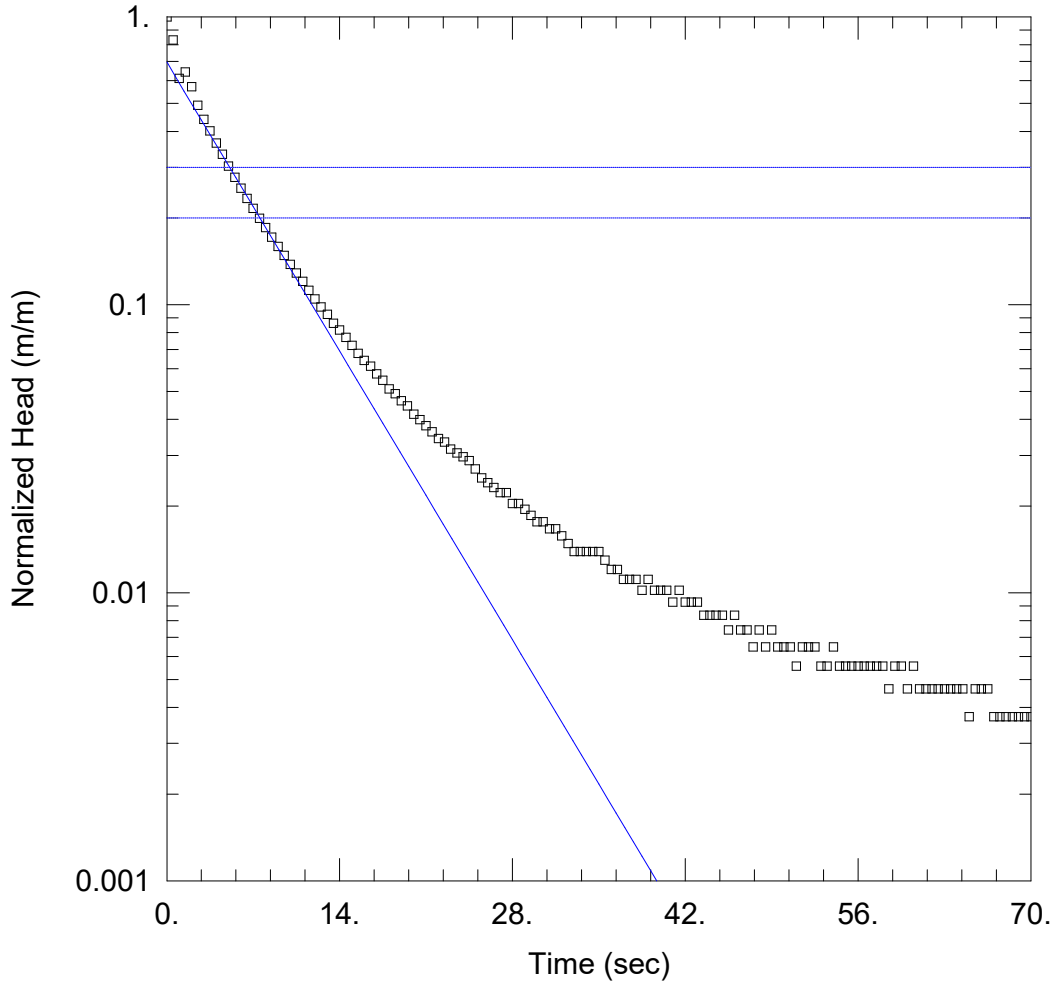
Saturated Thickness: 13.38 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW84 - Slug test 1 falling head)

Initial Displacement: 0.686 m
Total Well Penetration Depth: 12.38 m
Casing Radius: 0.025 m
Static Water Column Height: 13.38 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 2.64 m/day
y0 = 0.4543 m



WELL TEST ANALYSIS

Data Set: C:\...\MW84_Test_2_ris.aqt
Date: 08/17/23 Time: 12:50:27

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW84
Test Date: 9/08/23

AQUIFER DATA

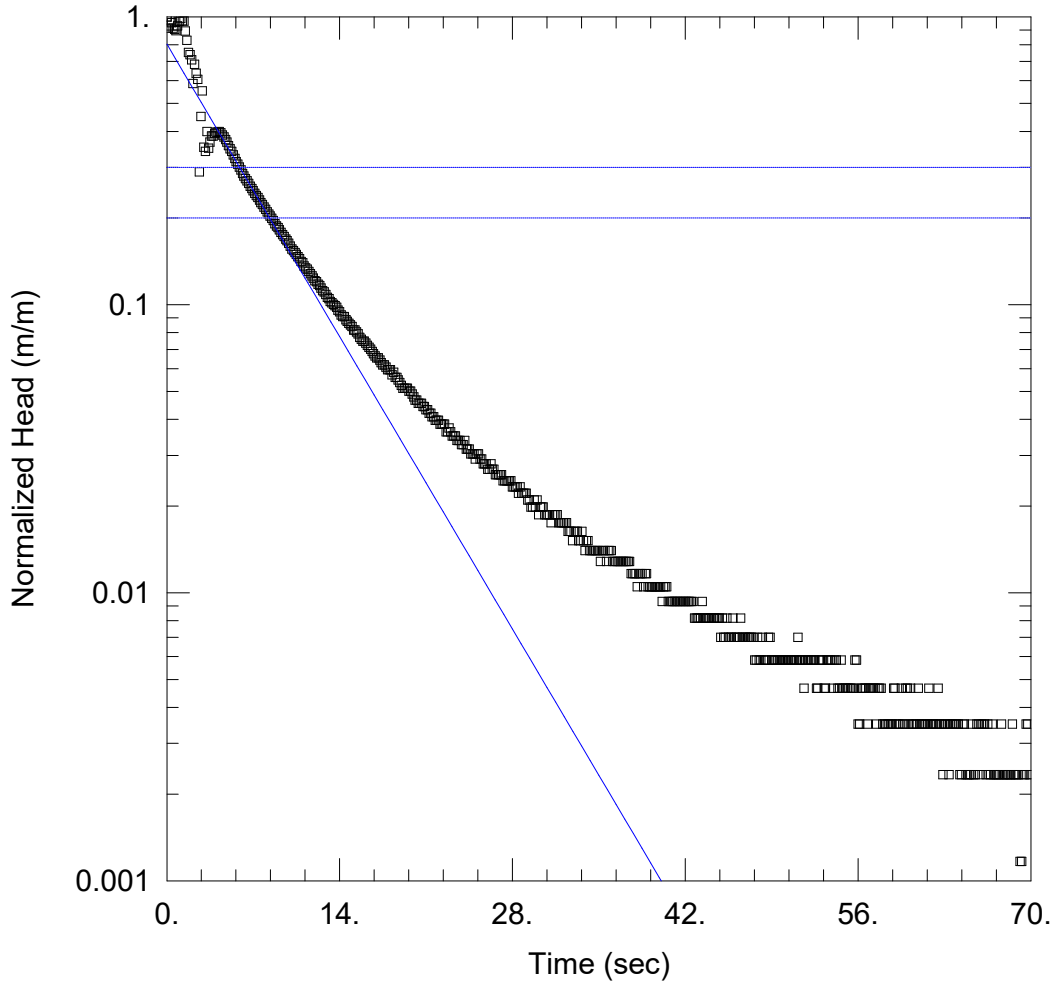
Saturated Thickness: 13.38 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW84 - Slug test 2 rising head)

Initial Displacement: -1.078 m
Total Well Penetration Depth: 12.38 m
Casing Radius: 0.025 m
Static Water Column Height: 13.38 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 3.626 m/day
y0 = -0.7497 m



WELL TEST ANALYSIS

Data Set: C:\...\MW84_Test_3_fal.aqt
Date: 08/17/23 Time: 12:50:47

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW84
Test Date: 9/08/23

AQUIFER DATA

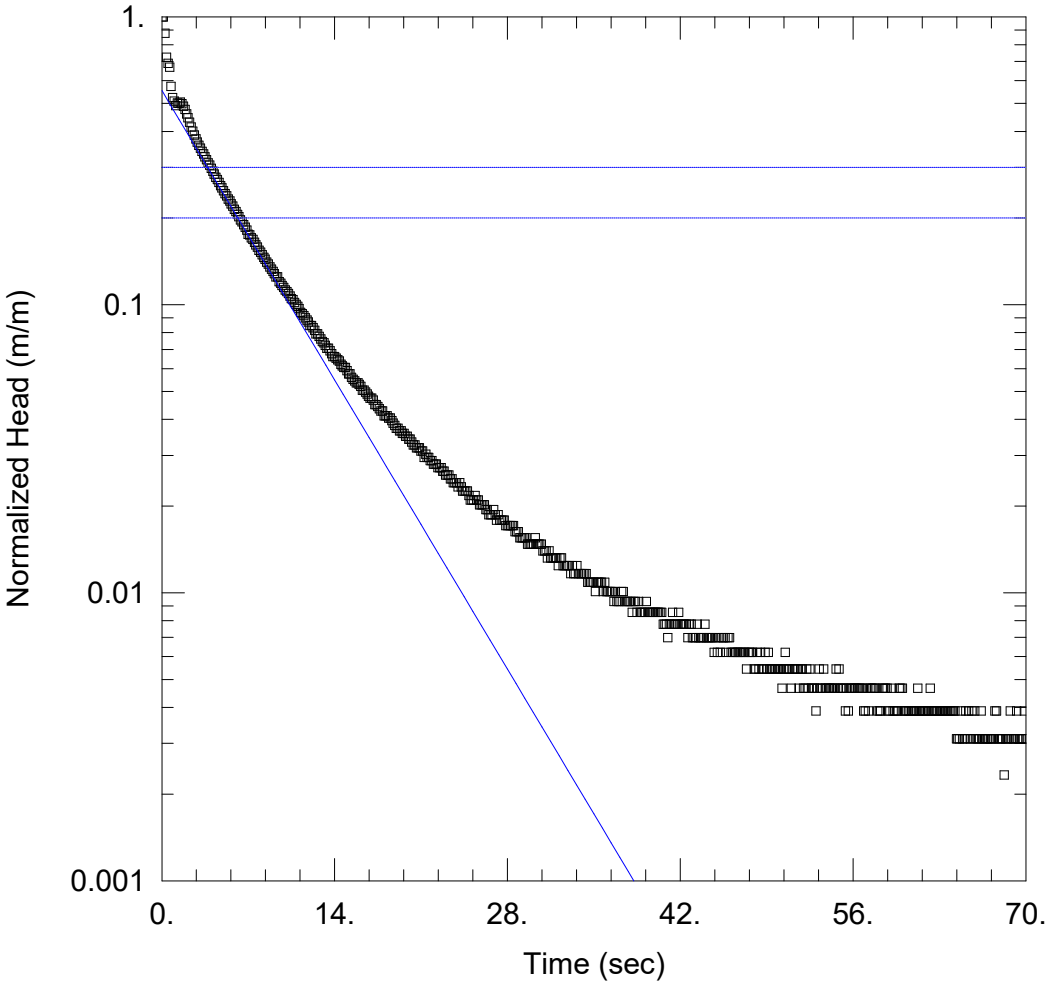
Saturated Thickness: 13.38 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW84 - Slug test 3 falling head)

Initial Displacement: 0.857 m
Total Well Penetration Depth: 12.38 m
Casing Radius: 0.025 m
Static Water Column Height: 13.38 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 3.673 m/day
y0 = 0.6893 m



WELL TEST ANALYSIS

Data Set: C:\...\MW84_Test_4_ris.aqt
Date: 08/17/23 Time: 12:51:05

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW84
Test Date: 9/08/23

AQUIFER DATA

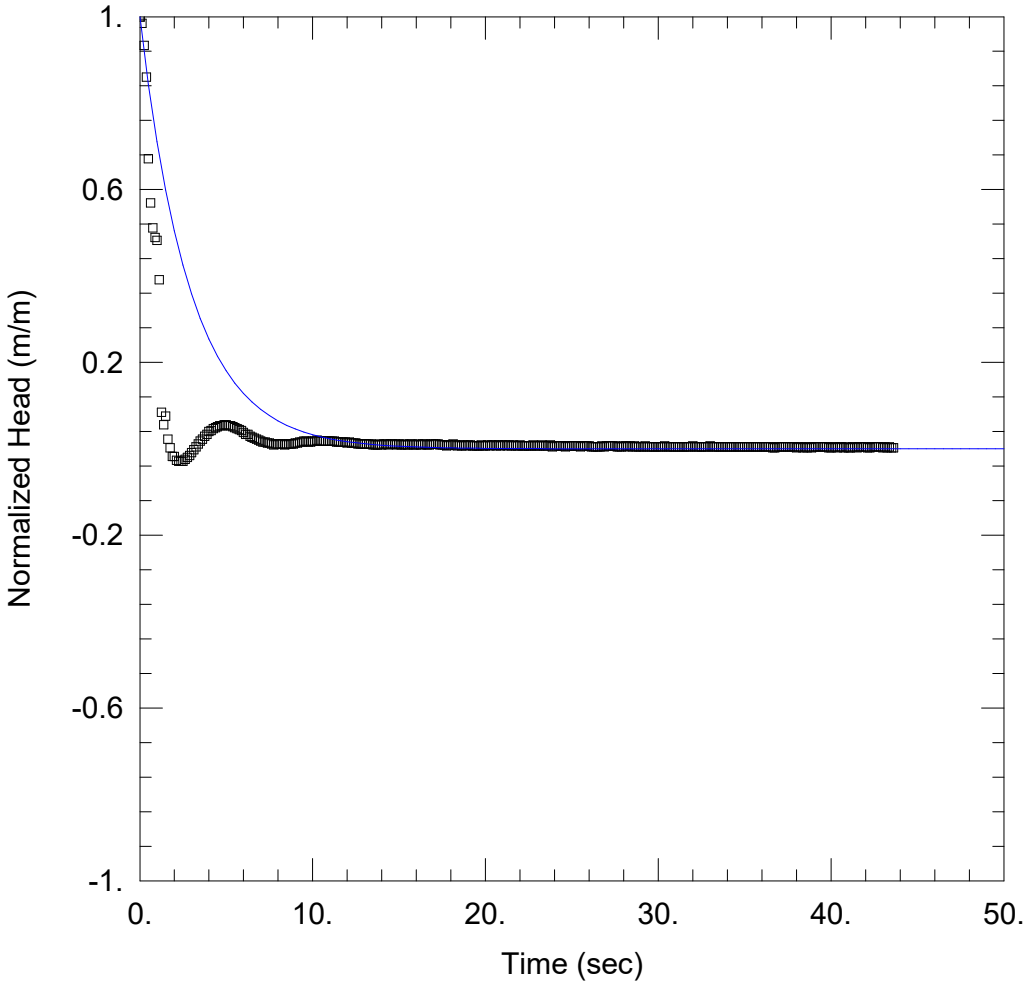
Saturated Thickness: 13.38 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW84 - Slug test 4 rising head)

Initial Displacement: -1.287 m
Total Well Penetration Depth: 12.38 m
Casing Radius: 0.025 m
Static Water Column Height: 13.38 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 3.633 m/day
y0 = -0.7138 m



WELL TEST ANALYSIS

Data Set: C:\...\MW91_Test_1_fal_Spr-Ge_V2.aqt
Date: 08/21/23 Time: 08:54:14

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW91
Test Date: 11/08/23

AQUIFER DATA

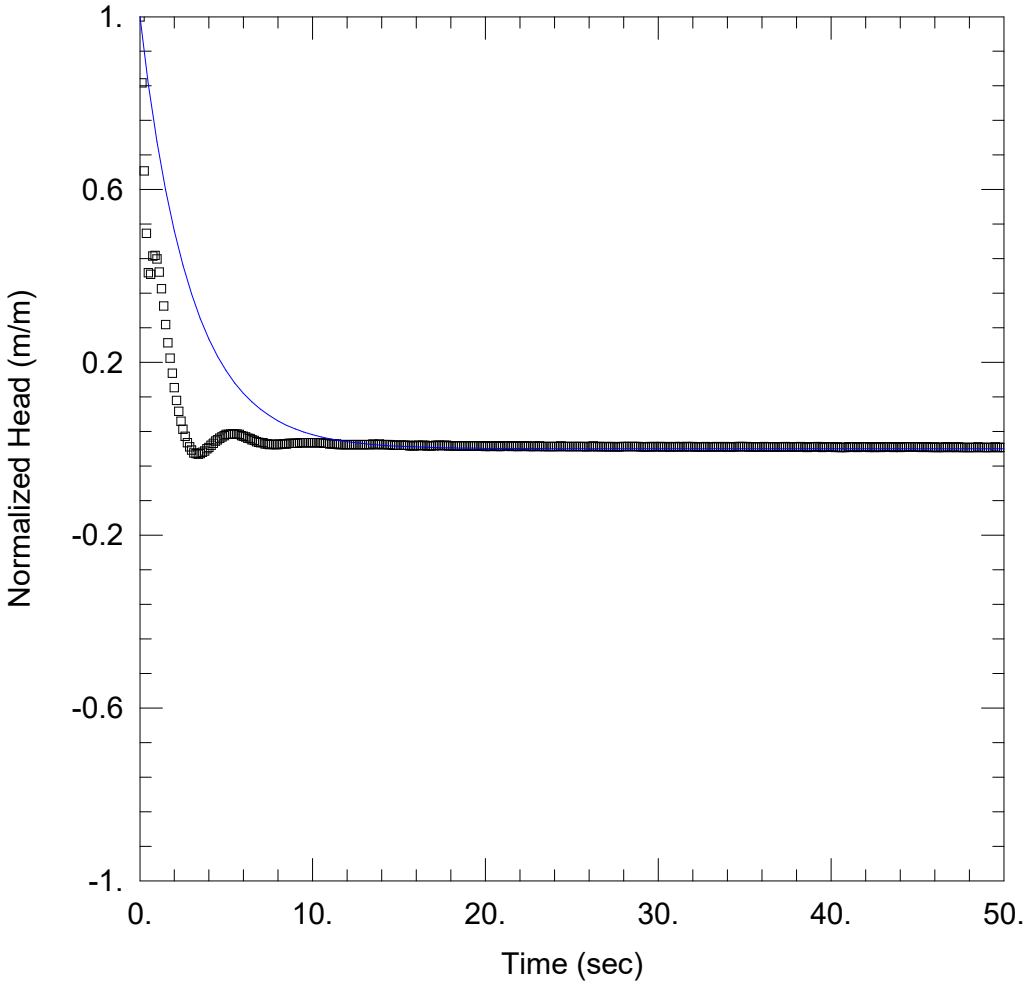
Saturated Thickness: 8.745 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW91 - Slug test 1 falling head)

Initial Displacement: 0.45 m Static Water Column Height: 8.745 m
Total Well Penetration Depth: 8.745 m Screen Length: 6. m
Casing Radius: 0.025 m Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Springer-Gelhar
K = 7.734 m/day Le = 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW91_Test_2_ris_Spr-Ge_V2.aqt
Date: 08/21/23 Time: 08:54:52

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW91
Test Date: 11/08/23

AQUIFER DATA

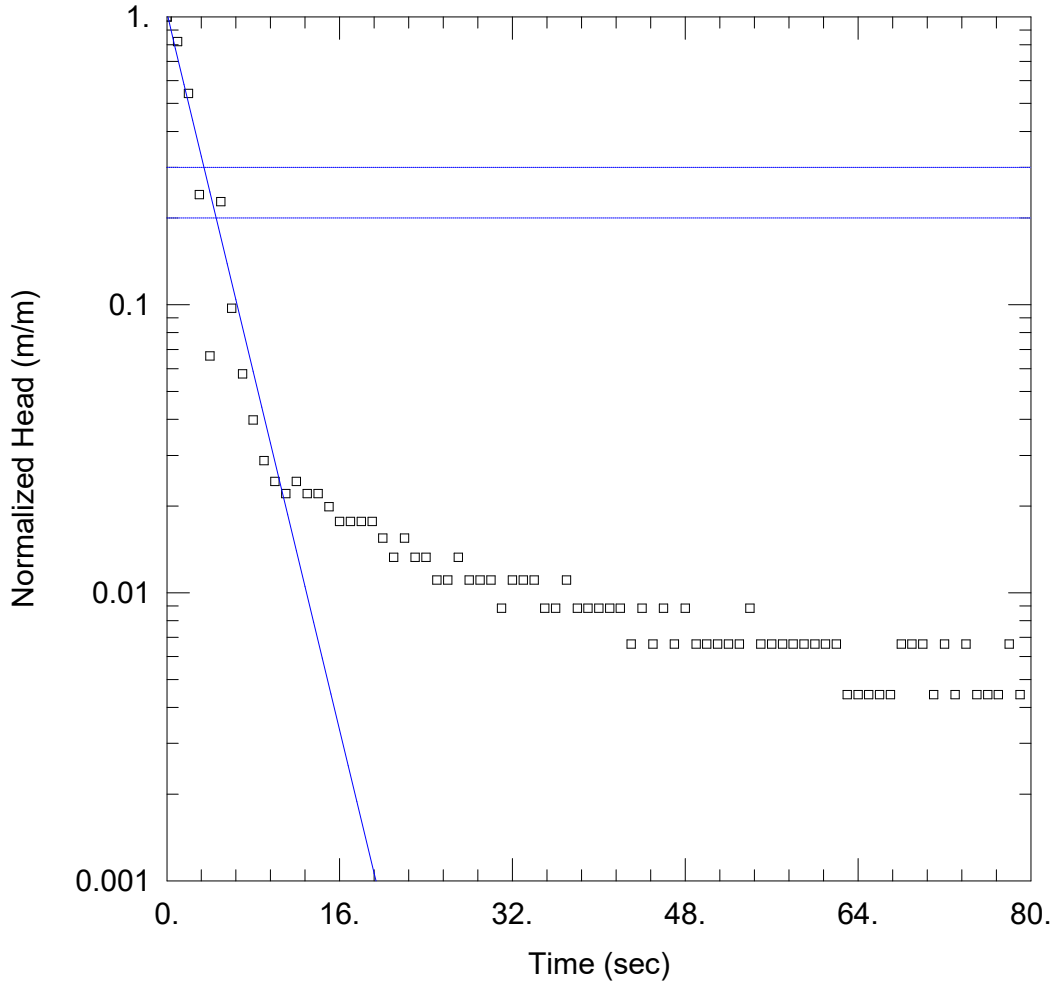
Saturated Thickness: 8.745 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW91 - Slug test 2 rising head)

Initial Displacement: -0.726 m
Total Well Penetration Depth: 8.745 m
Casing Radius: 0.025 m
Static Water Column Height: 8.745 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Springer-Gelhar
K = 7.734 m/day
Le = 0.1 m



WELL TEST ANALYSIS

Data Set: C:\...\MW94_Test_1_fal.aqt
Date: 08/17/23 Time: 13:00:22

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW94
Test Date: 5/08/23

AQUIFER DATA

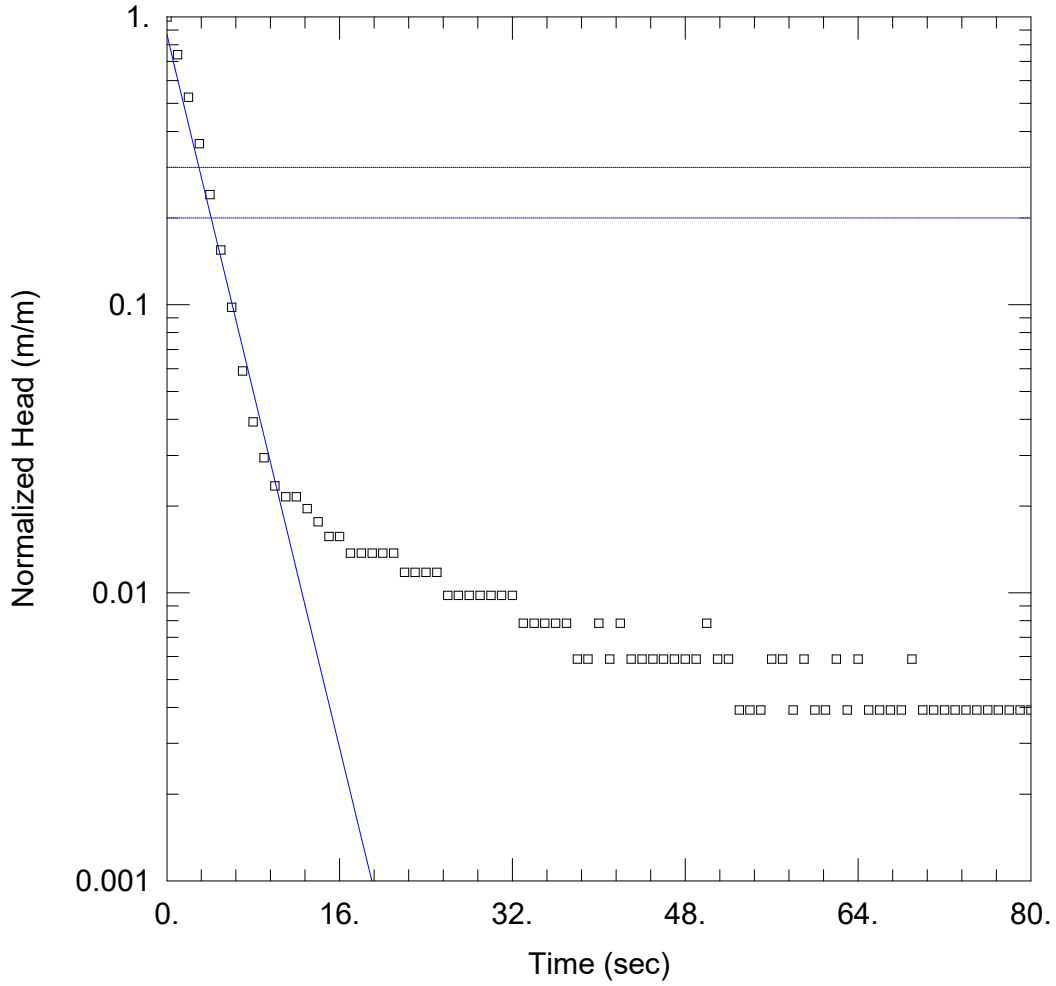
Saturated Thickness: 15.97 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW94 - Slug test 1 falling head)

Initial Displacement: 0.452 m
Total Well Penetration Depth: 15.97 m
Casing Radius: 0.025 m
Static Water Column Height: 15.97 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.754 m/day
y0 = 0.4667 m



WELL TEST ANALYSIS

Data Set: C:\...\MW94_Test_2_ris.aqt
Date: 08/17/23 Time: 13:00:45

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW94
Test Date: 5/08/23

AQUIFER DATA

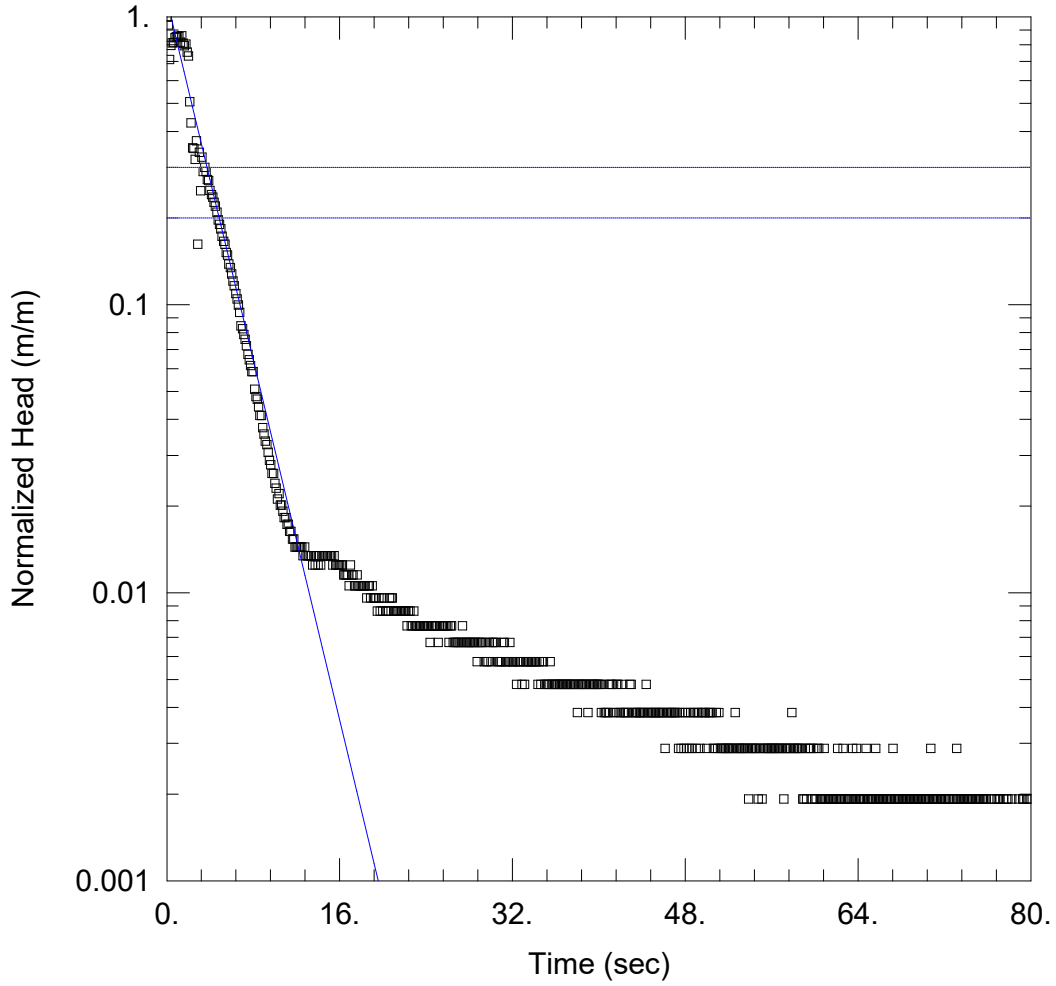
Saturated Thickness: 15.97 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW94 - Slug test 2 rising head)

Initial Displacement: -0.51 m
Total Well Penetration Depth: 15.97 m
Casing Radius: 0.025 m
Static Water Column Height: 15.97 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.706 m/day
y0 = -0.4428 m



WELL TEST ANALYSIS

Data Set: C:\...\MW94_Test_3_fal.aqt
Date: 08/17/23 Time: 13:01:08

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW94
Test Date: 5/08/23

AQUIFER DATA

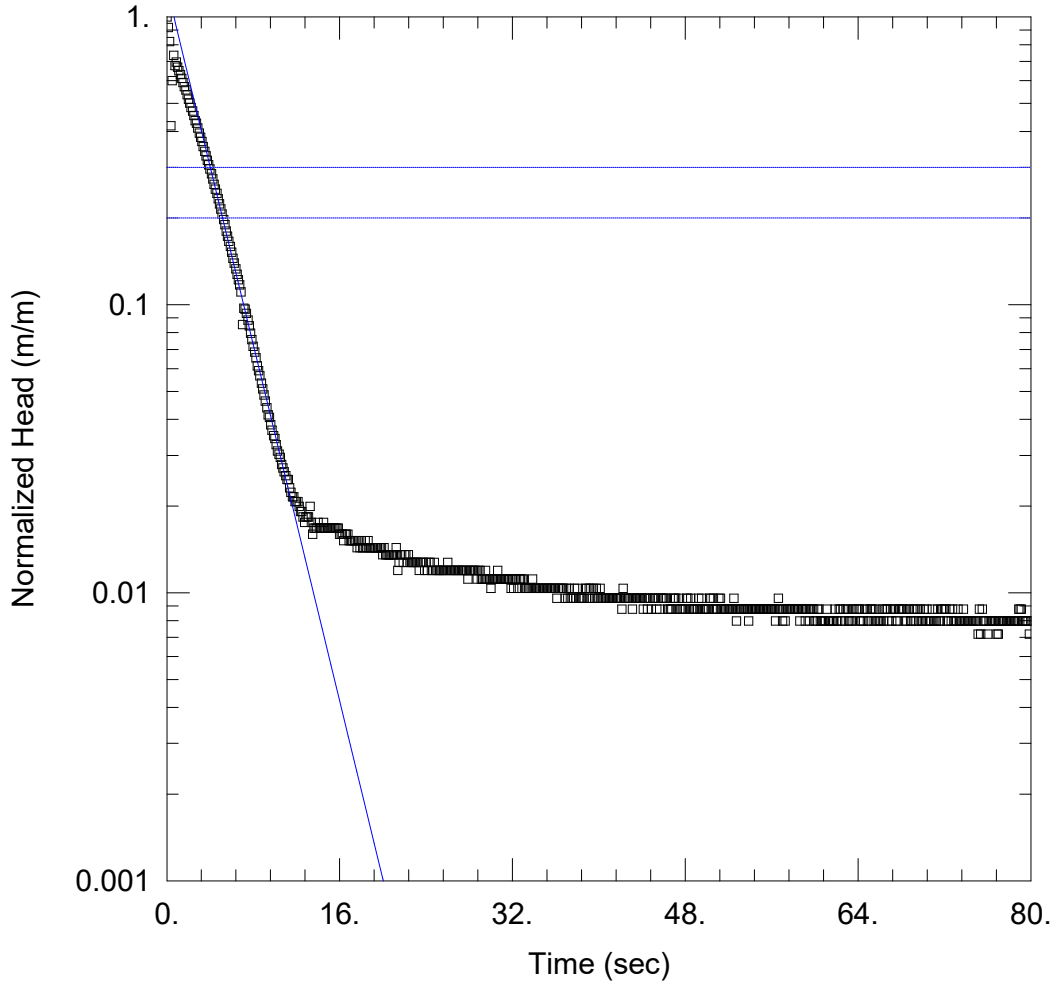
Saturated Thickness: 15.95 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW94 - Slug test 3 falling head)

Initial Displacement: 1.041 m
Total Well Penetration Depth: 15.95 m
Casing Radius: 0.025 m
Static Water Column Height: 15.95 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.789 m/day
y0 = 1.196 m



WELL TEST ANALYSIS

Data Set: C:\...\MW94_Test_4_ris.aqt
Date: 08/17/23 Time: 13:01:29

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW94
Test Date: 5/08/23

AQUIFER DATA

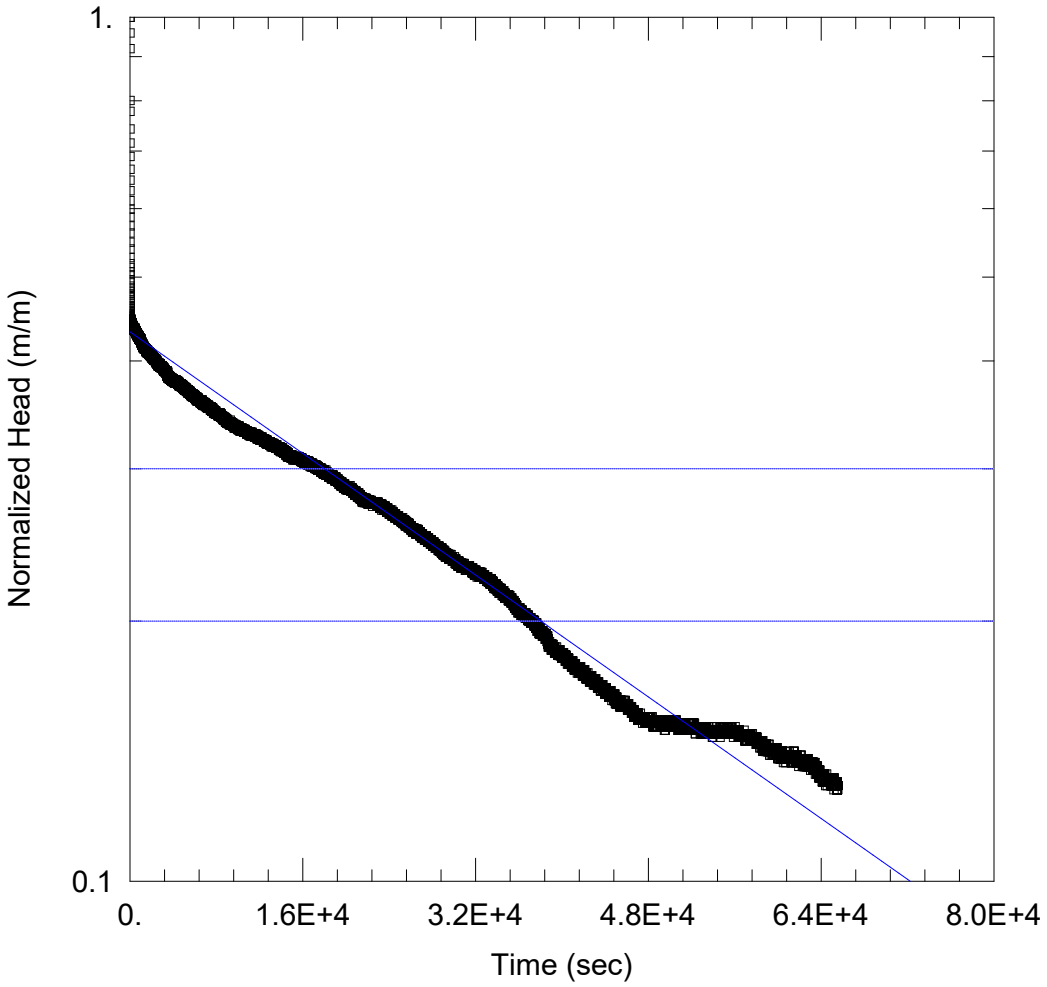
Saturated Thickness: 15.95 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW94 - Slug test 4 rising head)

Initial Displacement: -1.254 m
Total Well Penetration Depth: 15.95 m
Casing Radius: 0.025 m
Static Water Column Height: 15.95 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.701 m/day
y0 = -1.584 m



WELL TEST ANALYSIS

Data Set: G:\...\MW98_Test_1_fal_Full time steps_2nd fit.aqt
Date: 08/25/23 Time: 12:36:57

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW98
Test Date: 5/08/23

AQUIFER DATA

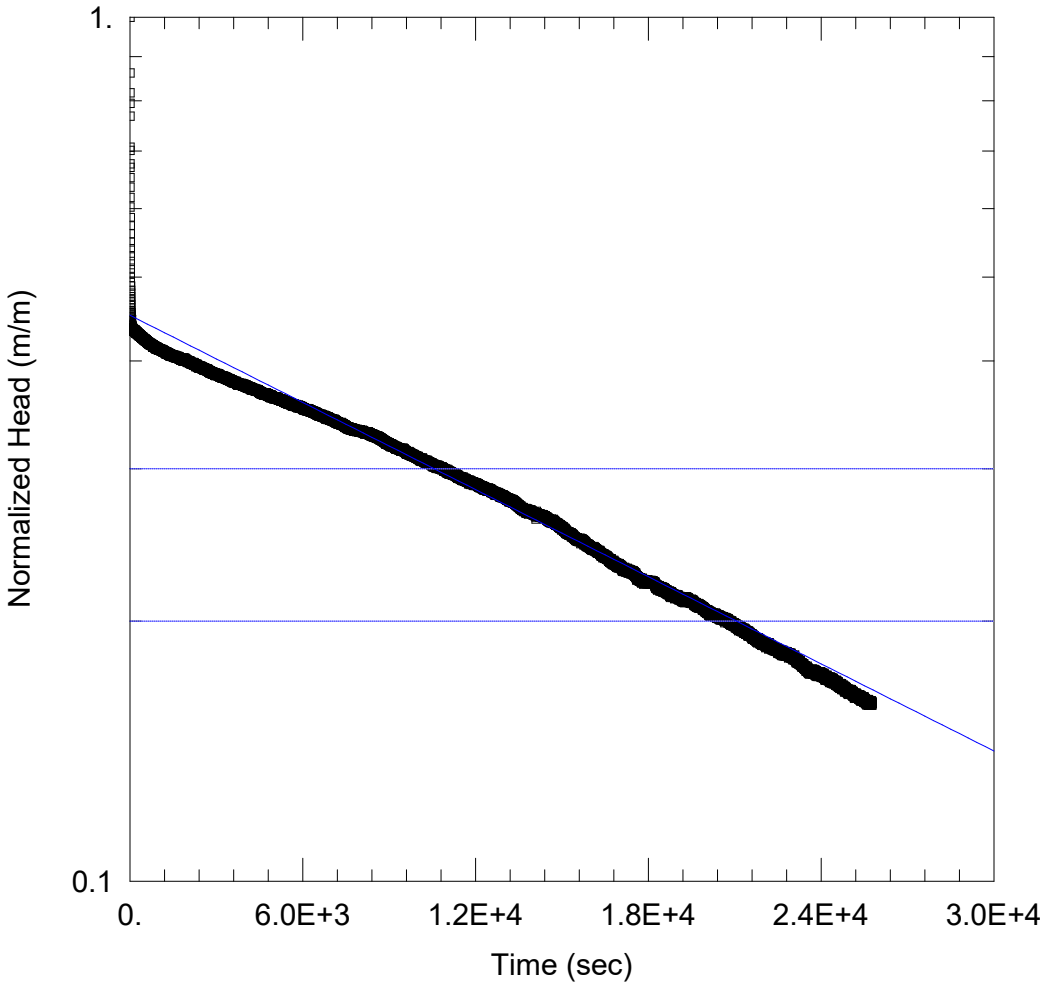
Saturated Thickness: 9.155 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW94 - Slug test 1 falling head)

Initial Displacement: 0.729 m
Total Well Penetration Depth: 9.155 m
Casing Radius: 0.025 m
Static Water Column Height: 9.155 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0004602 m/day
y0 = 0.3151 m



WELL TEST ANALYSIS

Data Set: G:\41\12609270\Tech\07 Data\05 Slug test results\MW98_Test_2_fal_2nd fit.aqt
Date: 08/25/23 Time: 12:42:07

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW98
Test Date: 5/08/23

AQUIFER DATA

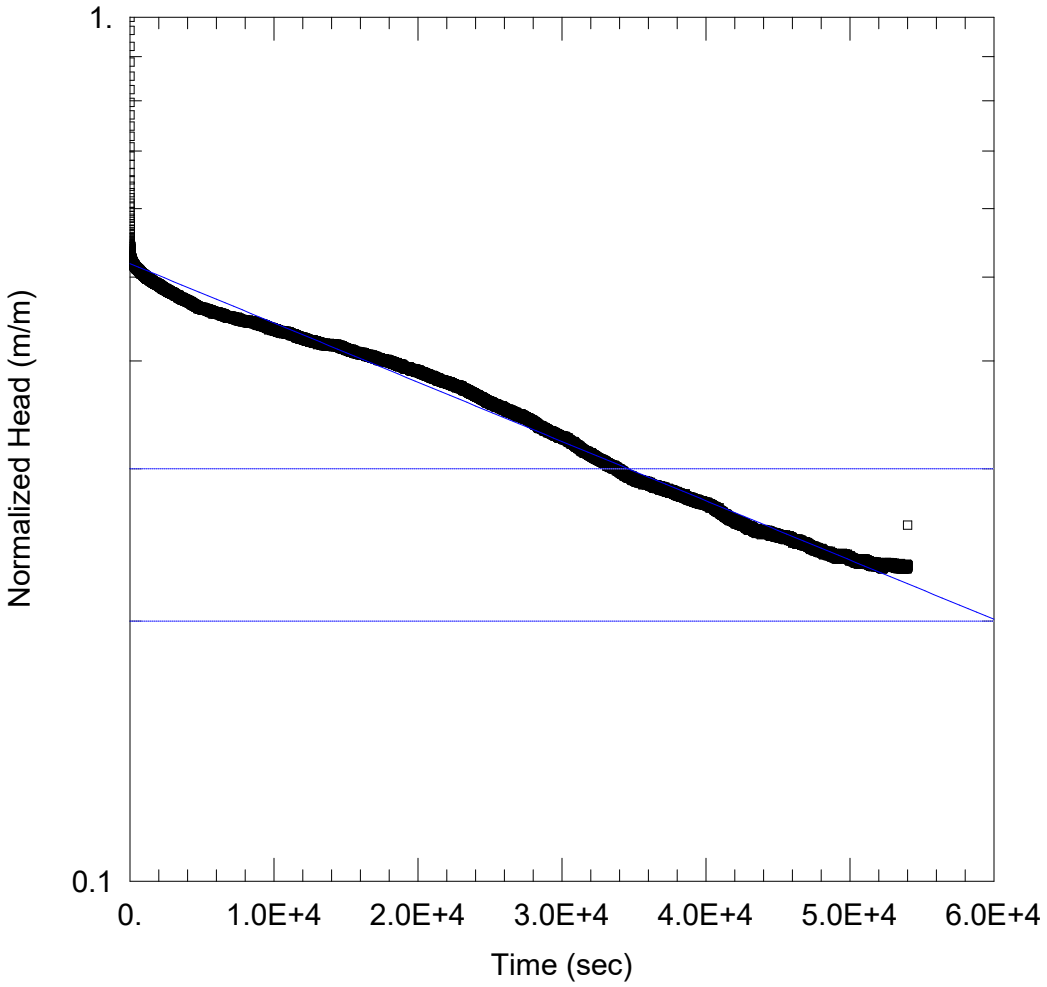
Saturated Thickness: 9.155 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW94 - Slug test 1 falling head)

Initial Displacement: 0.729 m
Total Well Penetration Depth: 9.155 m
Casing Radius: 0.025 m
Static Water Column Height: 9.155 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0008791 m/day
y0 = 0.3293 m



WELL TEST ANALYSIS

Data Set: G:\41\12609270\Tech\07 Data\05 Slug test results\MW98_Test_2_RH.aqt
Date: 08/25/23 Time: 12:45:27

PROJECT INFORMATION

Company: GHD
Client: CS Energy
Project: 12609270
Location: Callide Power Station
Test Well: MW98
Test Date: 10/08/23

AQUIFER DATA

Saturated Thickness: 9.139 m Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW94 - Slug test 2 - Rising head)

Initial Displacement: -0.6334 m
Total Well Penetration Depth: 9.139 m
Casing Radius: 0.025 m
Static Water Column Height: 9.139 m
Screen Length: 6. m
Well Radius: 0.05 m

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0003587 m/day
y0 = -0.3283 m

Appendix I

Pumping test analysis

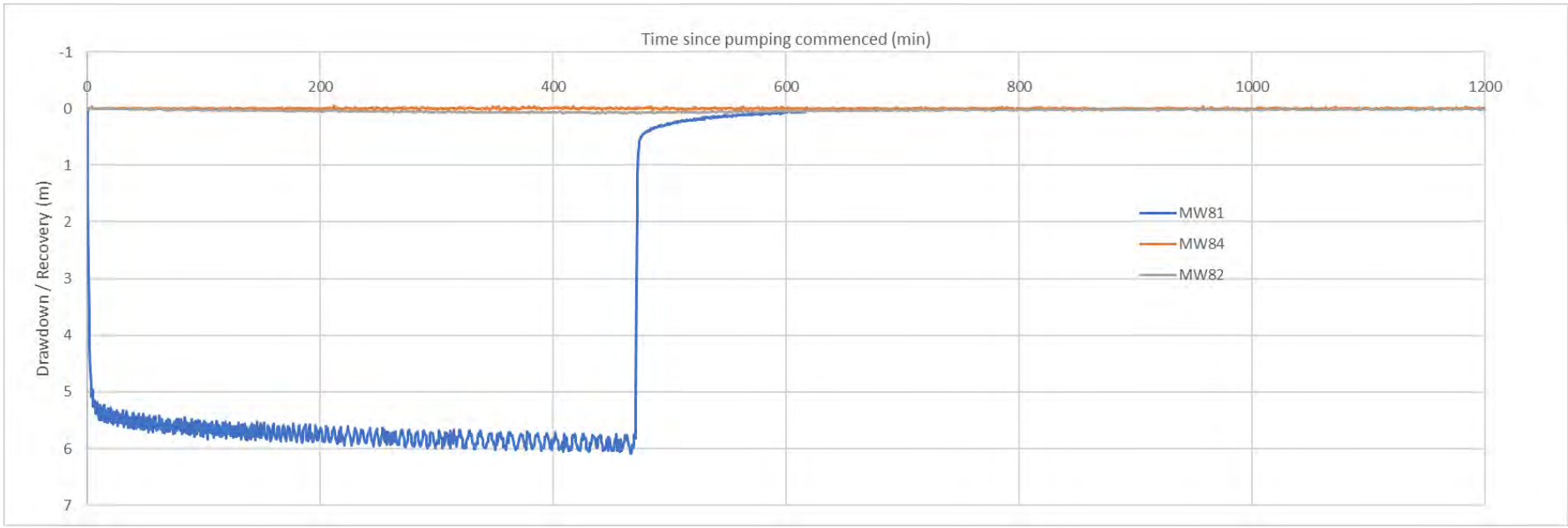


Figure I.1 Aquifer response to pumping – Bore MW81 constant rate pumping test

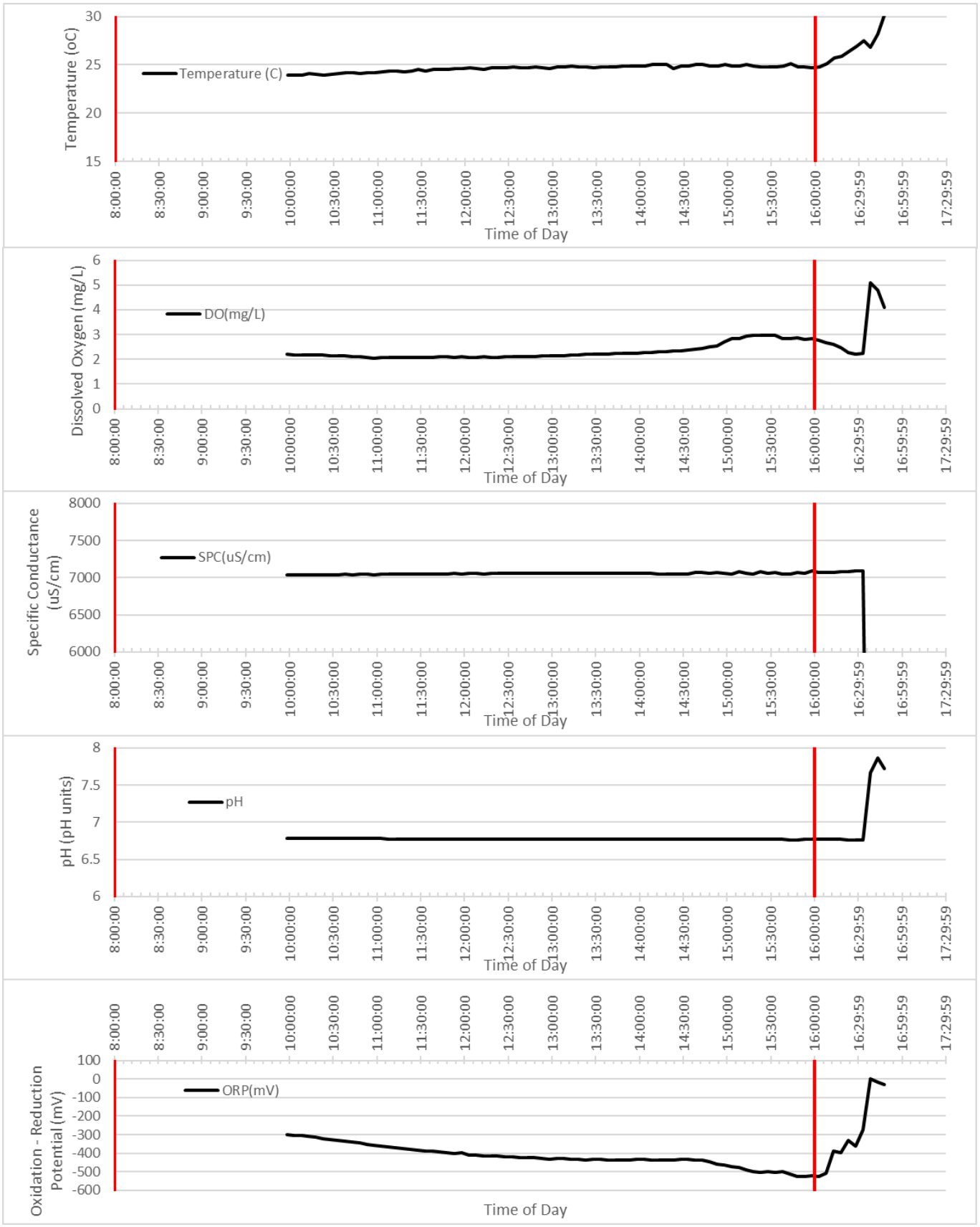


Figure I.2 ***Field water quality during bore MW81 constant rate pumping test***

Note: Red bars denote approximate pumping start and end times.

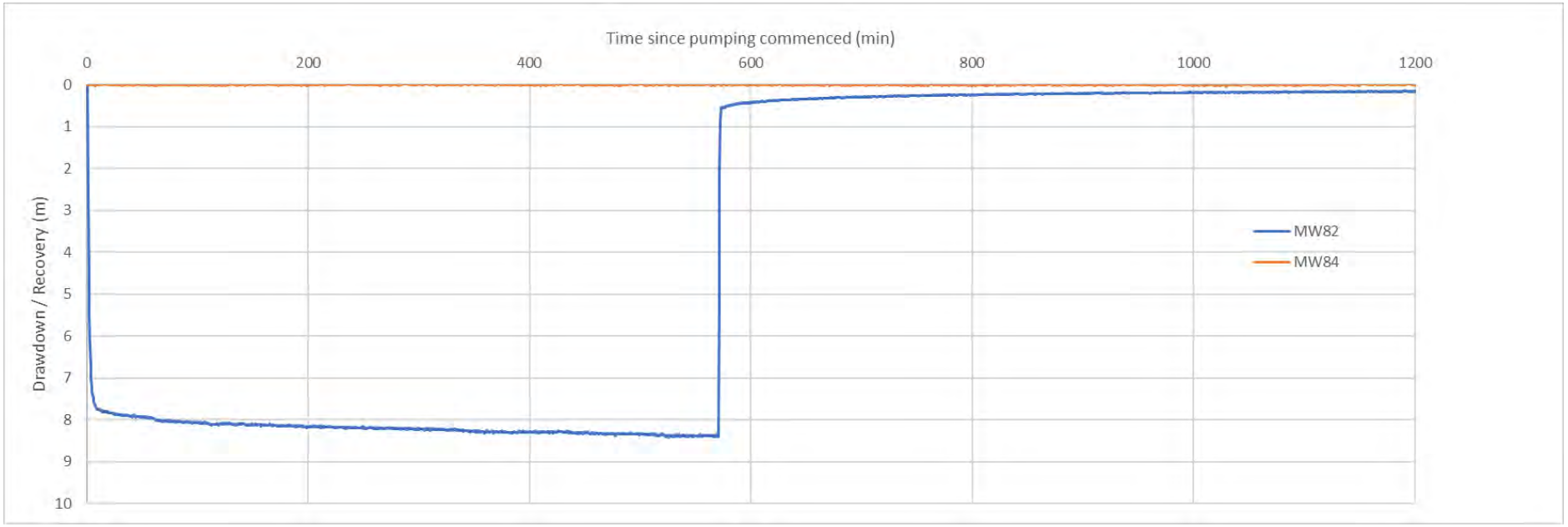


Figure I.3 Aquifer response to pumping – Bore MW82 constant rate pumping test

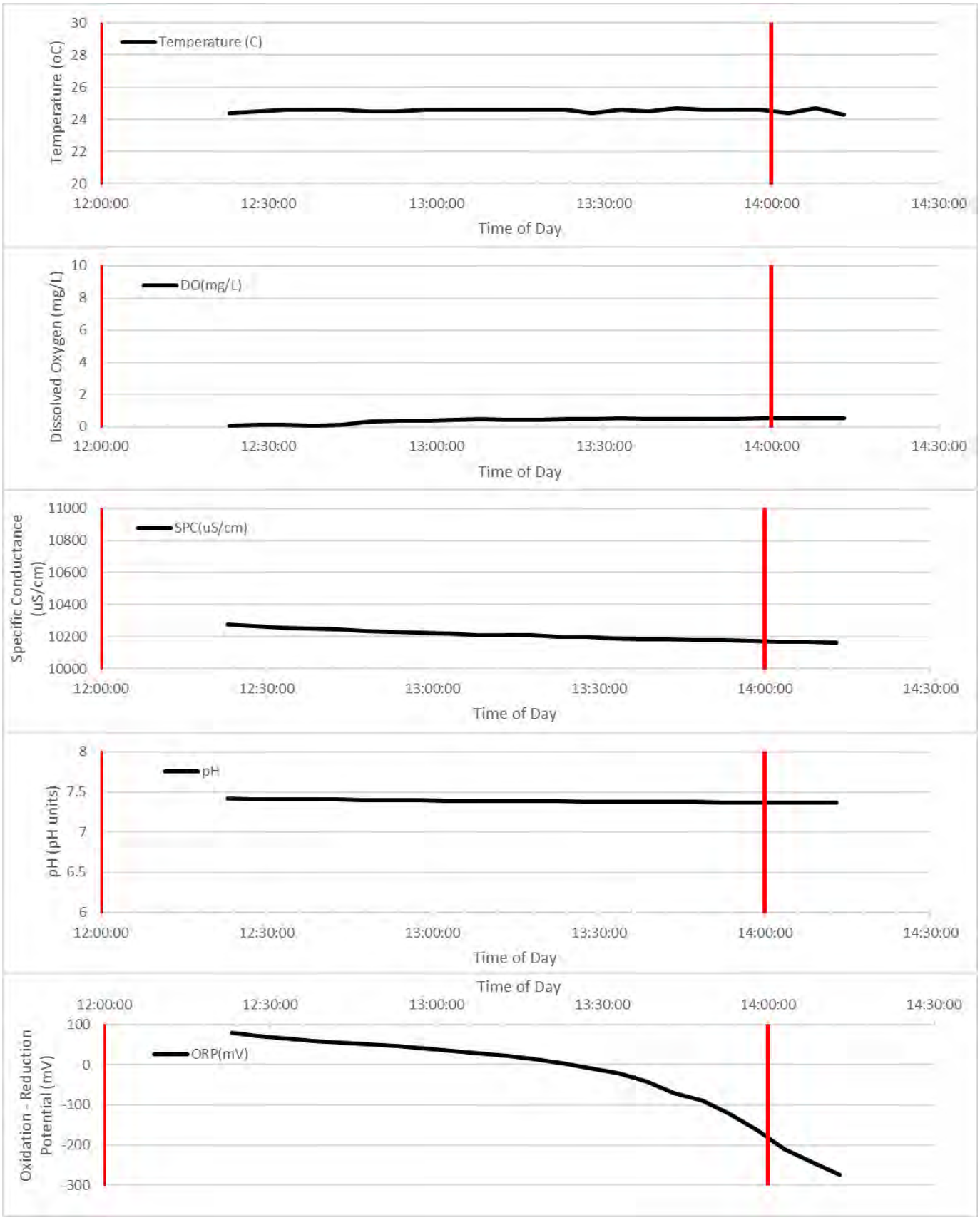


Figure I.4 Field water quality during bore MW82 step drawdown pumping test

Note: Red bars denote approximate pumping start and end times.

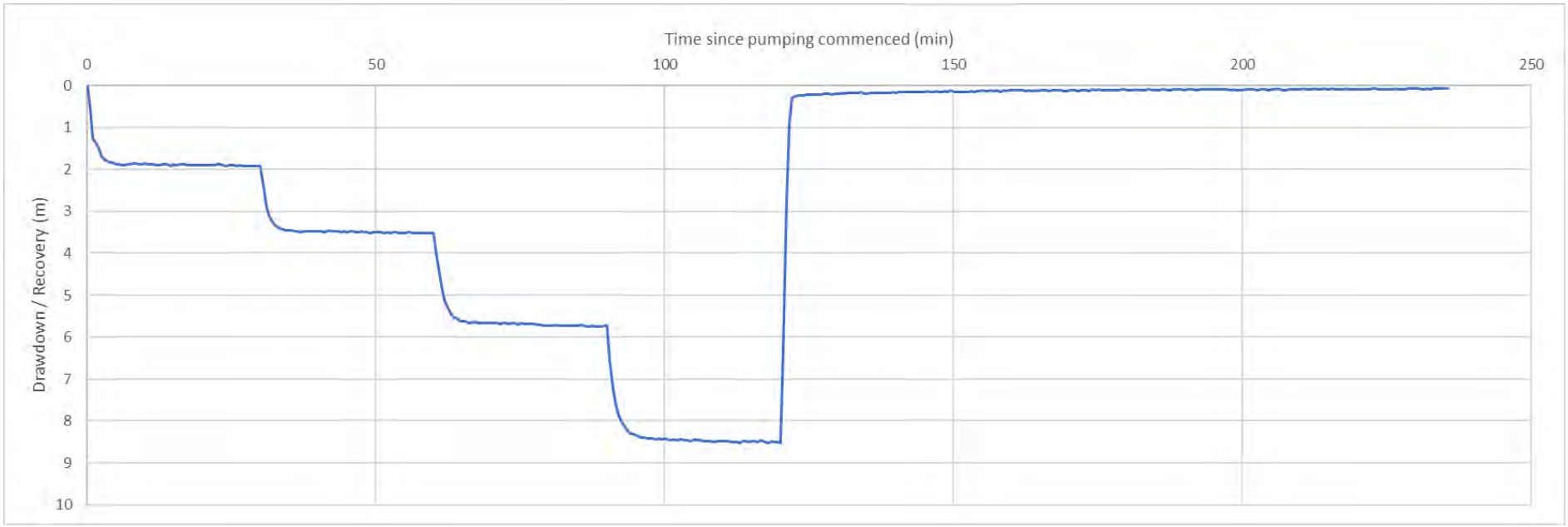


Figure I.5 Aquifer response to pumping – Bore MW82 strep drawdown pumping test

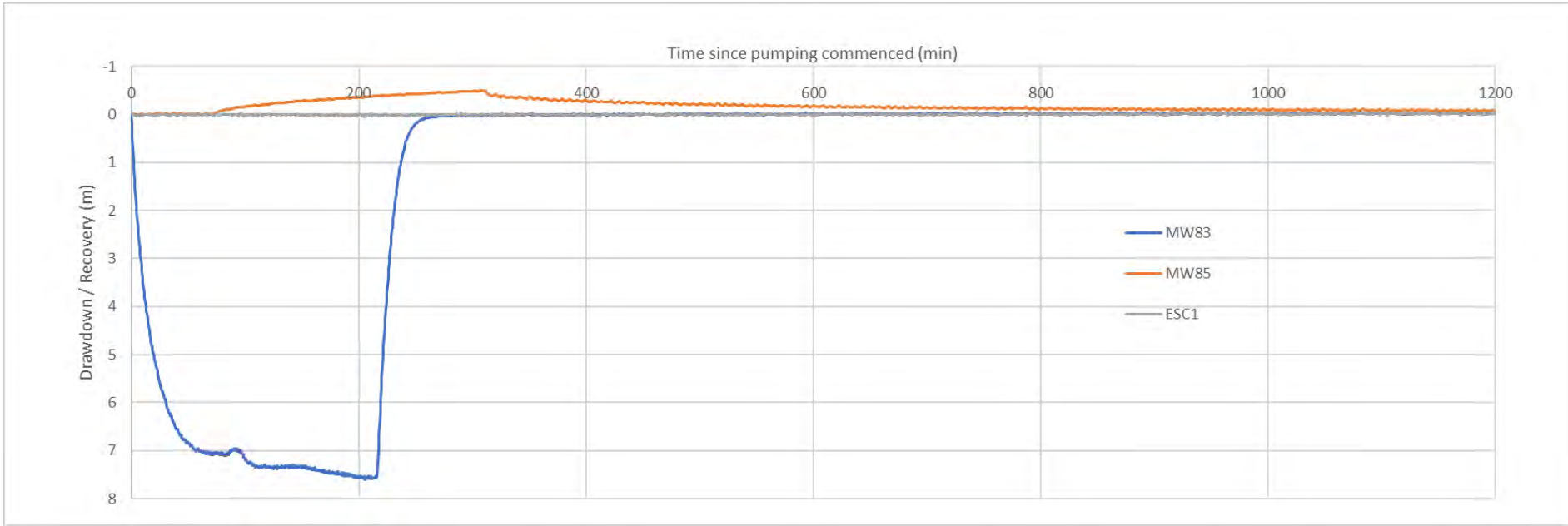


Figure I.6 Aquifer response to pumping – Bore MW83 constant rate pumping test

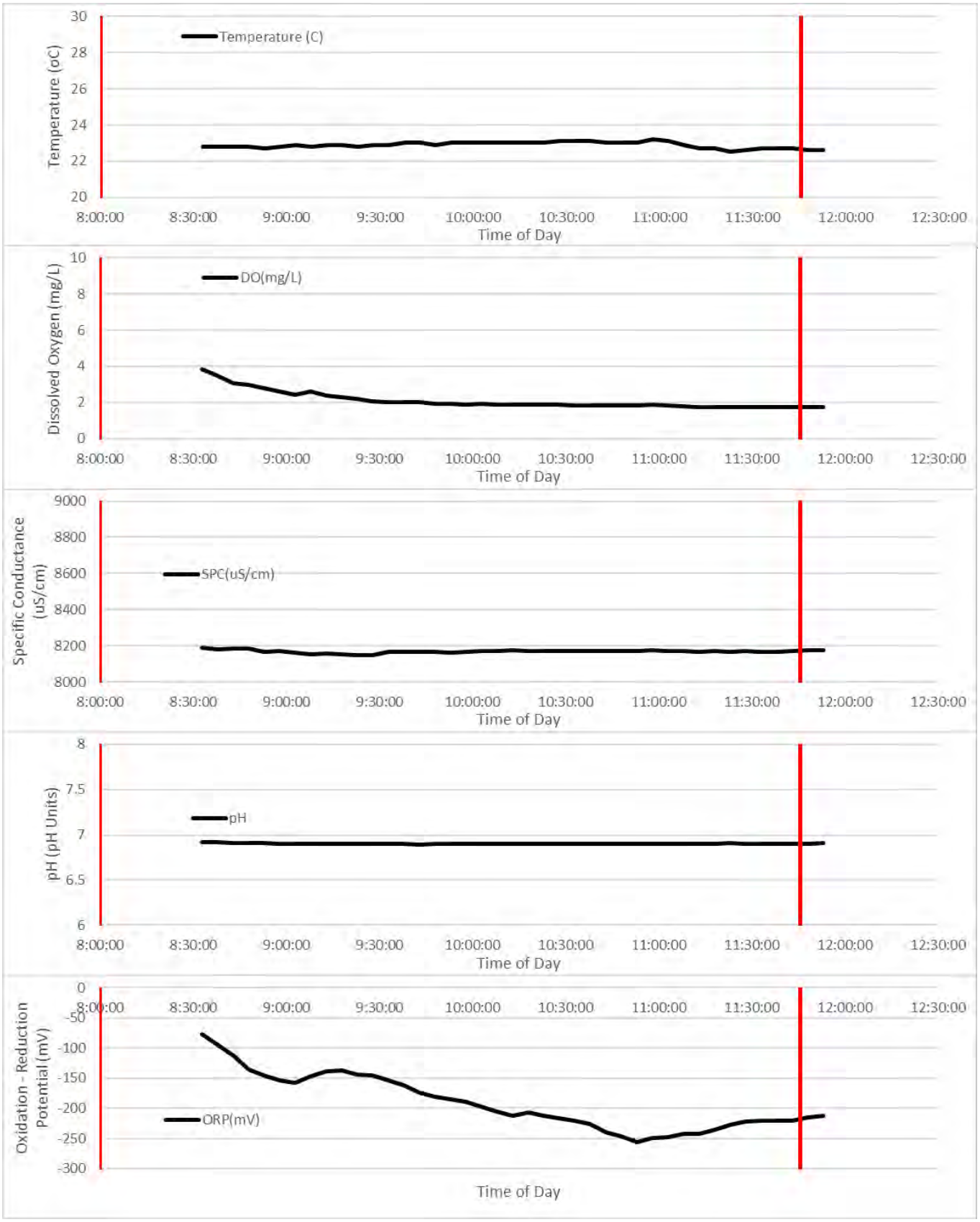


Figure I.7 Field water quality during bore MW83 constant rate pumping test

Note: Red bars denote approximate pumping start and end times.

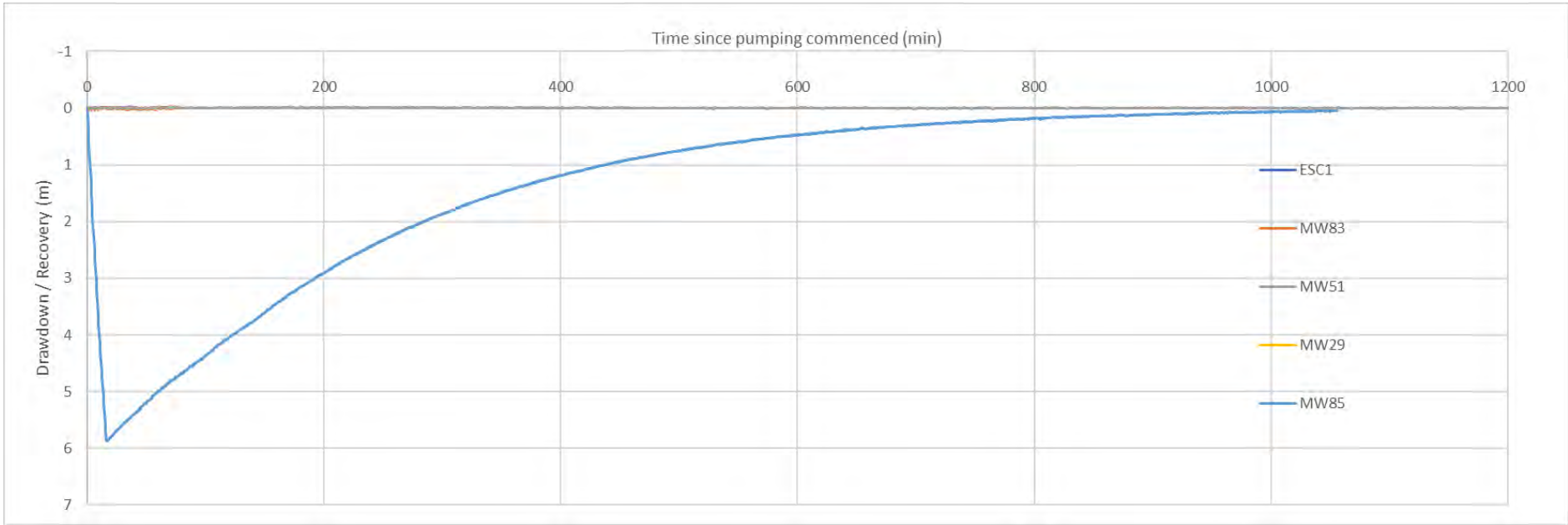


Figure I.8 Aquifer response to pumping – Bore MW85 constant rate pumping test

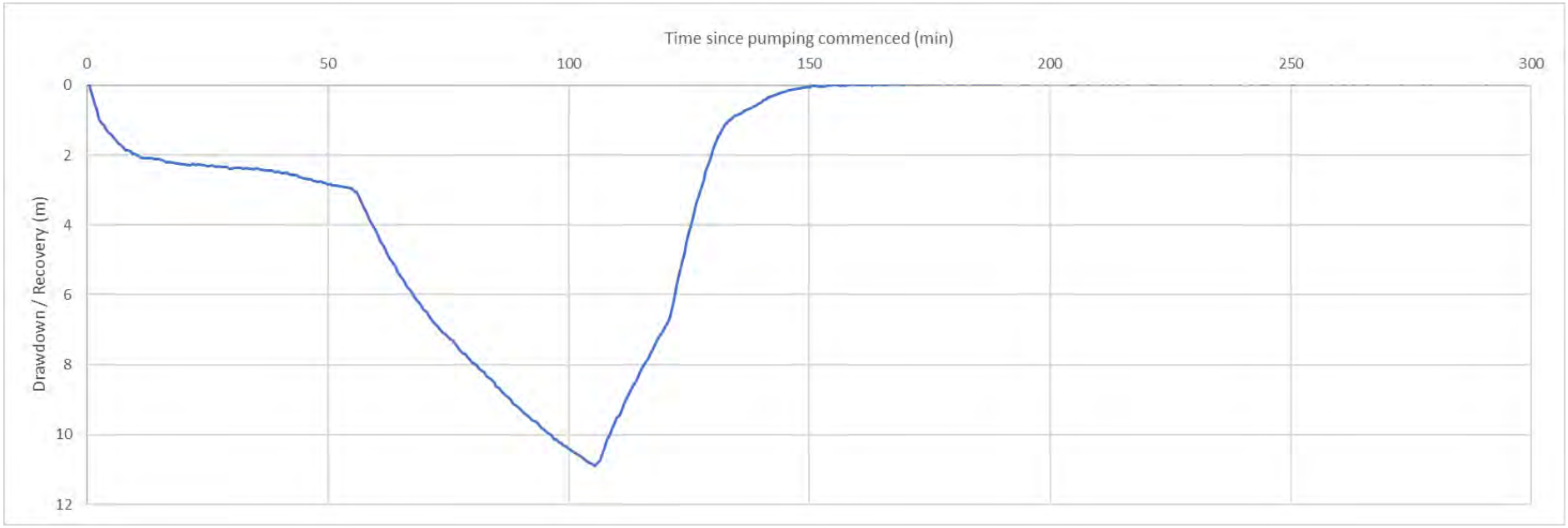


Figure I.9 Aquifer response to pumping – Bore MW90 step drawdown pumping test

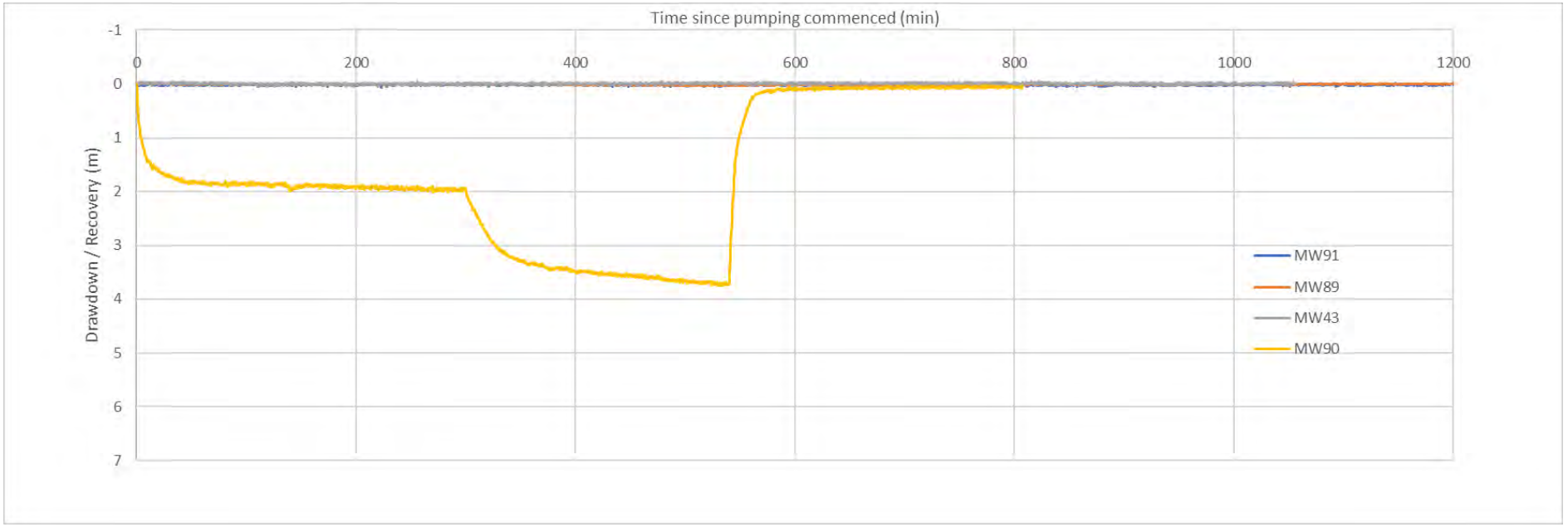


Figure I.10 Aquifer response to pumping – Bore MW90 constant rate pumping test

Appendix J

Monitoring bore maintenance program

Groundwater Monitoring Bores – Looking after your asset.



What can go wrong?

A common misconception with monitoring bores is that once they are installed there is no further works required during their lifespan. However, implementing an asset maintenance plan can get the most value from the bore and maximise the reliability of data obtained from it.

Issue	Source	Remediation
Headworks can be damaged by slashers, vehicles, vandals, mowers	Poor identification of the bore Poor headworks security	Maintaining locking mechanisms, marker posts *Lubricants need to be environmentally compatible
Roots and clogging of bore screens	Shallow bore with screen length incorporating unsaturated zone	Root clearing with redevelopment *Herbicides need to be environmentally compatible
Subsidence of annular materials around the bore (creating a depression around the headworks)	Poor construction practice	Additional of clean fill
Ground movement damaging casing or monument	Swelling soils, mine / quarry sites	Repair to monument
Sampling equipment blocking the bore / access to the screens	Poor sampling practice	'Fishing' of lost downhole equipment
Corrosion of steel casing materials	Casing material selection Valve material selection Aggressive geological materials	Resleeve of casing Replacement of bore
Collapse by squeezing formations / inadequate collapse resistance of casing or parting of joints	Poor bore design and construction practice	Replacement of bore
Blockages by foreign objects	Poor identification of the bore Poor headworks security	Maintaining locking mechanisms, marker posts
Siltation and blockage of screens	General site operations Screen / gravel pack design	Redevelopment
Rock falls in open holes	Poor construction practice	Resleeve of borehole Replacement of bore

Groundwater Monitoring Bores – Undertaking inspections



What can you do to maintain the monitoring asset?

It is good practice to complete an inspection of the monitoring bore as part of every site visit. A number of basic checks can be undertake as summarised in the table below.

Redevelopment is recommended every 5 – 10 years

Task	Frequency		Maintenance
	Every visit	Annually	
Confirm the lock operation and locking mechanism	✓	✓	Lubricating locks, locking mechanisms
Check condition of the monument / flush mounted cover	✓	✓	Painting of monument
Check stability of the monument / flush mounted cover	✓	✓	Add additional cement where casing moves. Resurvey where datum has shifted.
Check cleanliness of locking bolt threads and O-ring seal (for flush mounted Gatic™ installations).	✓	✓	Wire brush bolts, replace as necessary
Check condition of artesian valving	✓	✓	Replace as required
Check casing for sharp edges (that could damage measuring tapes / equipment deployed in bore)	✓	✓	File casing lip
Confirm bore depth / access into the screen zone		✓	If anomalous, review and plan intrusive investigation, e.g. inspection or redevelopment
Vegetation around the bore and access to the bore.	✓	✓	Slashing, application of herbicides (subject to bore use)
Check legibility of the identification plate / label	✓	✓	Replace label
Check presence of any marker post / protective bollard	✓	✓	Replace as required
Slumping around bore	✓	✓	Addition of clean fill around bore.
Water level (only) monitoring bores		✓	Bores that are not subject to sampling disturbance should be bailed annually to confirm that water levels are reacting and recovering.

Need to know more or need specialist advice?

Please contact local your local GHD office.



ghd.com

The Power of Commitment

Groundwater Sampling Report

Callide Groundwater Bore Drilling Project

CS Energy Limited

06 October 2023

→ **The Power of Commitment**



Project name		Callide Power Station PFAS Groundwater Bore Drilling Project						
Document title		Groundwater Sampling Report | Callide Groundwater Bore Drilling Project						
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			Name	**Signature**	**Name**	**Signature**	**Date**	
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S4	0	M Prskalo	A Thomas		A Thomas		06/10/2023	

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Contents

Abbreviations and acronyms 1

1. Introduction 3

1.1 Purpose of this report 3

1.2 Scope and limitations 3

1.3 Assumptions and qualifications 4

2. Methodology 5

2.1 Sampling locations 5

2.2 Sampling methodology 7

2.2.1 Groundwater sampling of recovery bores 7

2.2.2 Groundwater sampling of monitoring bores 8

2.2.2.1 Low-flow purging and sampling method 8

2.2.2.2 Bailer purging and sampling method 9

2.3 Decontamination procedure and rinsate sampling 9

2.4 Sample handling 9

2.5 Analytical schedule 9

3. Results 11

3.1 Relevant guidelines 11

3.2 Groundwater purging 11

3.3 Groundwater sampling results 12

3.3.1 Physicochemical field vs laboratory parameters 12

3.3.2 Laboratory analysis results 13

Inorganic analytes 13

Nutrient suite 14

Metals suite 14

Total organic fluorine 14

PFAS 14

PFAS TOPA 15

3.4 Quality assurance and quality control 19

3.4.1 Groundwater sampling program 19

3.4.1.1 Field procedures 19

3.4.1.2 Field QA/QC samples 19

3.4.1.3 Field QA/QC sample results 20

3.4.2 Laboratory QA/QC procedures and reporting 22

3.4.2.1 Laboratory QA/QC results 22

4. Conclusion 24

5. References 25

Table index

Table 2.1 Groundwater sampling locations summary 5

Table 2.2 Summary of sampling of recovery bores 7

Table 2.3 Summary of sampling of monitoring bores 8

Table 2.4	Analytical schedule and number of collected groundwater samples	10
Table 3.1	Water quality guidelines assessment	11
Table 3.2	Summary of bore purging prior to sampling	11
Table 3.3	Physicochemical field and laboratory parameters	12
Table 3.4	Summary of samples with metals exceedances of the selected water quality guidelines	14
Table 3.5	Summary of PFAS TOPA QA/QC compliance	15
Table 3.6	Summary of detected PFAS compounds in groundwater samples	17
Table 3.7	Summary of detected PFAS TOPA compounds in groundwater samples	18
Table 3.8	Summary of rinsates and field duplicate samples	19
Table 3.9	QA/QC blank samples analysis	20
Table 3.10	RPD exceedances	20
Table 3.11	Detected analytes in rinsate samples	22
Table 3.12	Summary of laboratory quality control sample analysis outliers for water samples analysis	22
Table 3.13	Summary of samples with raised LORs	23

Figure index

Figure 2.1	Groundwater sampling locations	6
Figure 3.1	Piper tri-linear plot of major ions	13

Appendices

Appendix A	YSI calibration certificate
Appendix B	Groundwater purging and sampling sheets
Appendix C	Groundwater results summary tables
Appendix D	Laboratory certificates

Abbreviations and acronyms

Term	Definition
AFFF	Aqueous Film Forming Foam
AGL	Above ground level
AHD	Australian Height Datum
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
AS/NZ	Australian Standard / New Zealand Standard
BGL	Below ground level
CoC	Chain of Custody
CSE	CS Energy Pty Ltd
DES	Department of Environment and Science
DO	Dissolved oxygen
DQI	Data quality indicator
EC	Electrical conductivity
EE	Environmental Evaluation
Fe	Iron
GDA94	Geocentric Datum of Australia 1994
GHD	GHD Pty Ltd
HDPE	High density polyethylene
HEPA	Heads of EPAs Australia and New Zealand
LOR	Limit of reporting
Mn	Manganese
NATA	National Association of Testing Authorities
ND	Not detected
ORP	Oxidation-reduction potential
PFAS	Per- and poly-fluoroalkyl substances
PFBS	Perfluorobutane sulfonic acid
PFBA	Perfluorobutanoic acid
PFHpS	Perfluoroheptane sulfonic acid
PFHpA	Perfluoroheptanoic acid
PFHxS	Perfluorohexane sulfonic acid
PFHxA	Perfluorohexanoic acid
PFPeS	Perfluoropentane sulfonic acid
PFPeA	Perfluoropentanoic acid
PFOS	Perfluorooctane sulfonic acid
PFOA	Perfluorooctanoic acid
QA	Quality assurance
QC	Quality control
RPD	Relative percent difference

Term	Definition
SOP	Standard operating procedures
SPC	Specific conductance
SWL	Standing water level
TDS	Total dissolved solids
ToC	Top of casing
TOF	Total organofluorine
TOPA	Total oxidisable precursor assay

Unit	Definition
m	Metre
mg/L	Milli-grams per litre
µg/L	Micro-grams per litre
µS/cm	Micro-Siemens per centimetre
ppm	Parts per million
%S	Percent saturation

1. Introduction

GHD Pty Ltd (GHD) completed a drilling and bore installation program as part of the *Callide Groundwater Bore Drilling Project* at CS Energy Limited (CSE) Callide Power Station located near Biloela, in Central Queensland.

CSE has undertaken a series of investigative works at Callide Power Station (the 'Project site') to investigate potential impacts and risks associated with the historical use of Aqueous Film Forming Foam (AFFF) at the site. The preliminary investigations were triggered by the Queensland Government's implementation of the *Environmental Management of Firefighting Foam Operational Policy* issued in July 2016. The policy provided information on the requirements for a three-year transition period to fluorine-free foams, or alternative foams containing at least 99.5% shorter-chain per- and poly-fluoroalkyl substances (PFAS).

Subsequent investigations were commissioned by CSE in response to the Department of Environment and Science (DES) notice to conduct an Environmental Evaluation (EE) (Reference: EPPR00536313 | CCPLRC-100046232, most currently dated 21 August 2023) requiring CSE to investigate and assess the source, cause, and extent of any actual or potential environmental harm resulting from the historical use of AFFF on site.

CSE prepared a scope of work to undertake a targeted drilling and monitoring bore installation program to fulfill the requirements of the EE and to further characterise the potential source and extent of PFAS contamination likely to be caused from the release of AFFF at the premises.

GHD were engaged to undertake the drilling, bore installation, and testing program. The Callide Power Station Groundwater Bore Drilling Project included the following tasks:

– Drilling and installation of five recovery bores and six monitoring bores
– Soil and drill cuttings sampling and analysis
– Pumping tests on the five recovery bores
– Groundwater sampling of newly installed bores plus one existing bore
– Survey of newly installed bores
– Reporting

The details of the field program are outlined in GHD (2023) report *Factual Bore Completion Report*.

1.1 Purpose of this report

The purpose of this report is to document the groundwater sampling methodology and summarise the results of the groundwater sampling analysis.

This report presents factual data collected and observations made during the groundwater sampling field program. This report should be read in conjunction with the *Factual Bore Completion Report* (GHD 2023a) and the *Soil Sampling Report* (GHD 2023b).

1.2 Scope and limitations

This report is subject to the limitations set out below and must be read in conjunction with each of the supporting technical reports summarised in Section 1.1, as well as the assumptions, exclusions, and qualifications within the supporting technical reports.

This report has been prepared by GHD Pty Ltd (GHD) for CS Energy Limited (CSE) for the purpose of responding to a notice to conduct an environmental evaluation issued by the administering authority pursuant to section 326B of the *Environmental Protection Act 1994* (Qld) (EP Act) (the Purpose), and not for any other purpose. The report may be used by Queensland Department of Environment and Science (DES), acting in its capacity as the administering authority (as defined in the EP Act)), and the appointed contaminated land auditor, and Luke Amies (Suitably Qualified Person) for the Purpose. GHD disclaims responsibility and liability to any person other than CSE arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally possible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

While every effort has been made by GHD to assess contamination as required by the scope of services, GHD cannot, guarantee that other issues outside of the scope of services do not remain.

GHD has prepared this report on the basis of information provided by CSE and others who provided information to GHD (including Government authorities and analytical laboratories), which GHD has not independently verified or checked beyond the agreed scope of work. Where drill hole logs, laboratory tests and similar work have been performed and recorded by others the data is included and used in the form provided by others. The responsibility for the accuracy of such data remains with the issuing authority, not with GHD. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described throughout this report. GHD disclaims liability arising from any of the assumptions being incorrect. The opinions, conclusions and any recommendations in this report are based on information obtained from site inspections and sample collection at discrete locations across the site and may not fully represent the conditions that may be encountered across the site at other than these locations. It is emphasised that the actual characteristics of the sub-surface and surface materials may vary significantly between adjacent test points and sample intervals and at locations other than where observations, explorations and investigations have been made. Sub-surface conditions, including groundwater levels and contaminant concentrations can change in a limited time. This should be borne in mind when assessing the data. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date the report was prepared.

It should be noted that because of the inherent uncertainties in the sub-surface evaluations, changed or unanticipated sub-surface conditions may occur that could affect the opinions GHD has expressed, which may need to be re-examined and changed. GHD does not accept responsibility for the consequences of significant variations in the conditions.

An understanding of the site conditions depends on the integration of many pieces of information, some regional, some site specific, some structure-specific and some experienced based. Hence, this report must be read in full and should not be altered, amended, or abbreviated, issued in part, or issued incomplete in any way without prior checking and approval by GHD.

GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date the report was prepared.

1.3 Assumptions and qualifications

The following assumptions and qualifications are made in relation to the content of this report:

– Groundwater sampling and analysis were generally carried out in accordance with the CSE-approved *Drilling, Testing, and Sampling Plan* (GHD, 2023d)

2. Methodology

2.1 Sampling locations

Groundwater sampling was completed on each of the recently installed recovery and monitoring bores plus one additional existing monitoring bore (MW78), as follows:

– Recovery bores: sampling completed during the pumping testing from 2 August to 10 August 2023
– Monitoring bores: sampling completed on 14 August to 15 August 2023

Each sampling points is shown on Figure 2.1 and the locations summarised in Table 2.1.

Table 2.1 Groundwater sampling locations summary

Location ID	Bore type	Easting (GDA94 Z56)	Northing (GDA94 Z56)	Top of casing elevation (m AHD)	Casing stickup (m)	Location
MW78	Existing bore	257791.6	7303619.9	Unknown	0.305	On site, next to new bore MW94
MW81	Recovery	258295.466	7304124.687	210.192	0.474	On site, Lower Ring Road
MW82	Recovery	258241.432	7304075.328	209.023	0.519	On site, Lower Ring Road
MW83	Recovery	257998.064	7303887.720	198.210	0.499	On site, Lower Ring Road
MW84	Monitoring	258370.406	7304141.737	213.278	0.670	On site, fire track
MW85	Recovery	258045.167	7303790.073	196.984	0.712	On site, fire track
MW86	Monitoring	257074.299	7303520.495	198.203	0.695	On site, fire track
MW89	Monitoring	258023.937	7303642.861	192.203	0.657	Off site
MW90	Recovery	258012.324	7303617.432	191.097	0.636	Off site
MW91	Monitoring	258097.269	7303613.698	193.772	0.726	Off site, Cocups Road
MW94	Monitoring	257792.558	7303623.283	194.311	0.519	On site, fire track
MW98	Monitoring	256822.495	7303493.653	190.004	0.597	On site, fire track

Table notes:
Survey of new recovery bores and monitoring bores completed by Fredriksen, Maclean and Associates. Coordinates are in GDA 94 Zone 56 and elevation is expressed in Australian Height Datum (AHD).



Paper Size ISO A3

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

CS Energy Limited
Groundwater Sampling Report

Groundwater sampling locations

Project No. **12609270**
Revision No. **A**
Date **03/10/2023**

FIGURE 2.1

\\ghdnet\GHD\AU\Brisbane\Projects\41\12609270\GIS\Maps\12609270_CallidePowerStation.aprx - 12609270_003_GroundwaterLocations
Print date: 03 Oct 2023 - 10:15

Data source: Basemaps_LatestStateProgram_AllUsers: . DoR: roads (2021), watercourse (2022), cadastre (2023); GHD: sample locations (2023). Created by: thunt2

2.2 Sampling methodology

Groundwater sampling was carried out in accordance with the following reference documents:

– Australian/ New Zealand Standard (AS/NZS) 5667.11 – 1998 (R2016) *Water Quality – Sampling – Part 11: Guidance on sampling of groundwaters*

– Department of Environmental and Science (DES) 2018 – *Monitoring and sampling manual*

– National Chemicals Working Group of the Heads of EPAs – Australia and New Zealand (HEPA), 2020, *PFAS National Environmental Management Plan – Version 2.0*

– National Environment Protection Council (NEPC), 2013: *National Environment Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM, as amended 2013)

Field physicochemical measurements were recorded for all groundwater samples using a calibrated YSI Pro Plus groundwater quality meter including parameters for pH, temperature, oxidation-reduction potential (ORP), dissolved oxygen (DO), specific conductance (SPC), and total dissolved solids. The physicochemical parameters were recorded periodically during purging to assess stabilisation of groundwater quality within each sampled bore. The YSI calibration certificate is provided in Appendix A.

Groundwater samples were collected into laboratory-supplied containers with preservatives appropriate for the analyte type and placed on ice in insulated containers while in the field. The samples were refrigerated at the end of each day. Samples were batched by placing into insulated containers with ice, packaged up and sent to ALS (primary laboratory) and Eurofins (secondary laboratory) under chain of custody (CoC) documentation for analysis.

2.2.1 Groundwater sampling of recovery bores

Groundwater samples from the recovery bores were collected during the pumping tests using the Grundfos pump deployed for the testing, completed between 2 August and 10 August 2023. Sampling of recovery bore MW85 was not completed during the pumping testing as the bore ran dry during the step test, and the sample was collected several days later when the bore had recovered.

Generally, one sample was collected approximately 1 to 2 hours after the constant rate test had started, and in some bores a second sample was collected within the last hour of the pumping test. The samples collected for the recovery bores are summarised in Table 2.2.

Table 2.2 Summary of sampling of recovery bores

Bore ID	Date	Time	Sample ID	QA samples	Comments
MW81	04/08/2023	09:00	MW81_PT_01	RS02_GW	Rinsate sample from Grundfos pump collected after constant rate pumping test completed on MW81 (RS02_GW, collected 05/08/2023)
	04/08/2023	15:30	MW81_PT_02	–	
MW82	07/08/2023	09:40	MW82_PT_01	FD01_GW / FS01_GW / RS01_GW	Duplicate samples taken from parent sample MW82_PT_01 Rinsate sample from Grundfos pump collected after constant rate pumping test completed on MW82 (RS01_GW, collected 07/08/2023)
	07/08/2023	16:00	MW82_PT_02	–	
MW83	02/08/2023	09:10	MW83_PT_01	–	Second primary sample was not collected as the pump was shutoff after 4 hours into the test due to an approaching lightning storm, where the Waste Containment Facility (WCF) was evacuated. Rinsate sample was not collected from Grundfos pump after use in MW83.
MW85	14/08/2023	12:00	MW85_GW	RS03_GW	Rinsate sample from Grundfos pump collected after step pumping test completed on MW85 (RS03_GW, collected 09/08/2023)

Bore ID	Date	Time	Sample ID	QA samples	Comments
					A step test was started on 09/08/2023, however the pump was shut off 16 mins after test commenced as the bore ran dry. A sample was not collected at that time. A constant rate test was not completed. The bore was later sampled by getting a grab sample with a bailer (bore was not purged prior to sampling) on 14/08/2023 after the bore had recharged.
MW90	10/08/2023	11:18	MW90_PT_01	RS04_GW	Rinsate sample from Grundfos pump collected after constant rate pumping test completed on MW90 (RS04_GW, collected 11/08/2023)
	10/08/2023	16:15	MW90_PT_02	–	

2.2.2 Groundwater sampling of monitoring bores

Groundwater sampling was completed for the newly installed monitoring bores and one existing monitoring bore (MW78). New monitoring bore MW86 was found to be dry and therefore was not sampled. A total of seven primary samples were collected between 14 August to 15 August 2023.

The samples collected for the monitoring bores are summarised in Table 2.3.

Table 2.3 Summary of sampling of monitoring bores

Bore ID	Date	Time	Sample ID	QA samples	Comments
MW78	15/08/2023	11:28	MW78_GW	–	Sampled using low-flow
MW84	14/08/2023	16:10	MW84_GW	FD02_GW / FS02_GW	Sampled via bailer Duplicate samples taken for parent sample MW84_GW
MW86	14/08/2023	14:30	–	–	Bore is dry, therefore no sample collected
MW89	15/08/2023	13:30	MW89_GW	–	Sampled via bailer
MW91	15/08/2023	14:21	MW91_GW	RS05_GW	Sampled using low-flow. Rinsate sample was collected from QED Sample Pro pump at the end of the day after sampling from MW91 was completed (RS05_GW, collected 15/08/2023)
MW94	15/08/2023	08:28	MW94_GW	–	Sampled via bailer
MW98	15/08/2023	07:05	MW98_GW	–	Bore was bailed dry on 14/08/2023 at 14:05. Left overnight to recharge and sampled the following morning via bailer

Two out of the six monitoring bores were purged and sampled using a low-flow pump (MW78 and MW91), however the pump controller malfunctioned, therefore the remaining bores were purged and sampled with a bailer. The sampling method for each is outlined as follows.

2.2.2.1 Low-flow purging and sampling method

The low-flow purging and sampling method is outlined as follows:

– The standing water level (SWL) was measured from top of casing (ToC) using an electronic dip meter.

– A QED Sample Pro bladder pump was used to purge and sample two bores (MW78 and MW91). It should be noted that Air-Met supplied equipment and consumables that were free of perfluorinated compounds, and therefore the equipment would not contaminate groundwater samples with PFAS.
– The pump utilised disposable bladders, which were replaced following pump use in each bore. The pump housing was decontaminated after each use as per the decontamination procedure outlined in Section 2.3.
– Teflon-free, dedicated, and disposable high-density polyethylene (HDPE) tubing was connected to the pump, where the air-line was connected to the MP10 controller and the water-line was connected to the flow cell.
– The pump was deployed on a hanging cable. The sample intake point was placed within the bottom half of the bore's screen interval and the flow rate was reduced to achieve a low flow sampling effect, whereby water is preferentially drawn in through the screen. This was verified by monitoring the water level during purging, to ensure excessive drawdown was not occurring.
– Field physicochemical parameters were monitored during low flow purging with a calibrated YSI Pro water quality meter.

2.2.2.2 Bailer purging and sampling method

The bailer purging and sampling method is outlined as follows:

– The SWL was measured from ToC with an electronic dip meter.
– The casing volume was calculated using the formula for a cylinder (πr^2) using the casing internal diameter multiplied by the water column (depth of bore minus water level).
– Using a single-use disposable bailer connected to a hand reel, the monitoring bores were purged the minimum purge volume (minimum 3 casing volumes, or until dry).
– During the purging process the field physicochemical parameters were monitored.
– Where a bore was purged dry the bore was allowed to recharge overnight and a sample was taken the following day with a bailer and the field physicochemical parameters recorded.

2.3 Decontamination procedure and rinsate sampling

The dip meter, the bailer reel, submersible Grundfos pump and the low-flow pump were decontaminated between sampling locations using the following procedure:

– Immersing the equipment in a bucket containing a solution of deionised water and low phosphate detergent (Liquinox®), which is confirmed as PFAS-free. A plastic scrubbing brush was used on the pump housing.
– Rinsing the equipment is a series of three buckets filled with deionised water.
– Final rinse with deionised water in a spray bottle.

One rinsate sample per day was collected from the submersible Grundfos pump and the low-flow pump following decontamination. Rinsate blanks were collected on two occasions (FB01_GW and FB02_GW). Rinsate water from ALS was supplied in 5 L bottles (one rinsate blank from each bottle).

2.4 Sample handling

Once collected, the groundwater samples were placed into ice-chilled insulated containers while in the field and then stored in a fridge. Samples were batched into insulated containers packed with ice, for transport under chain of custody (CoC) documentation to laboratories certified by National Association of Testing Authorities (NATA) for analysis.

Collection of quality assurance and quality control (QA/QC) samples included duplicates (field blank and field split), rinsates samples from the pumps, rinsate blanks for PFAS, and transport blanks for PFAS.

2.5 Analytical schedule

The analytical schedule and the collected groundwater samples are summarised in Table 2.4.

The groundwater sampling field physicochemical and laboratory results are reported in Section 3.

Table 2.4 Analytical schedule and number of collected groundwater samples

Type	Parameter	Primary samples	Duplicates (blind and split) samples	QA samples
Field physicochemical	pH, specific conductance (SPC) / electrical conductivity (EC), oxidation-reduction potential (ORP), dissolved oxygen (DO), temperature	14	2	–
Laboratory suites – Primary samples	Inorganics: pH, EC, TDS, suspended solids, major anions and cations, hardness, fluoride			
	Nutrient suite: ammonia, nitrate, nitrite, reactive phosphorus			
	Metals suite: Total and dissolved metals (Fe, Mn)			
	PFAS – Super ultra-trace long suite (28 analytes)			
	PFAS – Low level Total Oxidisable Precursor Assay (TOPA, 28 analytes)			
	Total organic fluorine (TOF)			
Rinsate	Analysis as per the Primary sample laboratory suites (excluding dissolved metals)	–	–	5
Field blanks	PFAS – Super ultra-trace long suite (28 analytes)	–	–	3
Transport blanks	PFAS – Super ultra-trace long suite (28 analytes)	–	–	2

Notes:

– Primary groundwater samples: Eight samples from recovery bores (2 x MW81, 2 x MW82, 1 x MW83, 1 x MW85, 2 x MW90). Six samples from monitoring bores (MW78, MW84, MW89, MW91, MW94, MW98).

– Duplicates: 1 duplicate sample in 10 primary groundwater samples, therefore two duplicate samples collected

– Four rinsate samples from pumping test Grundfos pump. One rinsate sample from low-flow QED Sample Pro pump.

3. Results

3.1 Relevant guidelines

The guideline values selected to compare the analytical results are listed in Table 3.1 along with the rationale for selection.

Table 3.1 Water quality guidelines assessment

Assessment	Guideline	Rationale
General water quality parameters for humans and aquatic ecosystems	Australian Drinking Water Guidelines (ADWG) 2011 Aesthetic (v3.7 updated 2022)	The ADWG 2011 was selected to assess the potential exposure of impacted groundwater to groundwater users.
	ADWG 2011 Health (v3.7 updated 2022)	
	ADWG 2011 Recreational (v3.7 updated 2022)	
General water quality parameters for aquatic ecosystems	ANZG (2018) – Freshwater – 99% (updated 26 July 2021)	Environmental Protection (Water and Wetland Biodiversity) Policy – the EPP (Water and Wetland Biodiversity) – Fitzroy Basin assigns high ecological value to Groundwaters for protection of aquatic ecosystems. Therefore the ANZG 2018 Freshwater 99% was selected to assess water quality on aquatic ecosystems.
PFAS for human and aquatic ecosystems exposure	PFAS NEMP 2.0 2020 – Health drinking water	The PFAS NEMP 2.0 was selected to assess potential exposure of PFAS-impacted groundwater to groundwater users and aquatic ecosystems. Health drinking water and Recreational water was selected to assess risk to humans from consumption and exposure to impacted water. For contaminants that are bioaccumulative the Water Quality Guideline Framework[1] specifies that the 99% species protection DGV is used, however the 99% species protection is just above the laboratory LOR, therefore any detect of PFAS exceeded the guideline value (every sample). Therefore the 95% species protection has been selected.
	PFAS NEMP 2.0 2020 – Recreational water	
	PFAS NEMP 2.0 2020 – Freshwater – 95% - slightly to moderately disturbed systems	

3.2 Groundwater purging

Results of the purging are summarised in Table 3.2, and the purging and sampling sheets are included in Appendix B.

Table 3.2 Summary of bore purging prior to sampling

Bore ID	Casing diameter (mm)	Water column (m)	Casing volume (L) (x3)	Volume purged (L)	Purged and sampled via
MW78	125	14.2	174.8 (522.5)	15	Low-flow pump
MW81	147	13.4	227.3 (681.9)	5,887 (sample 1) 45,987 (sample 2)	Grundfos pump
MW82	147	16.6	281.6 (844.8)	17,190 (sample 1)	Grundfos pump

[1] https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/localconditions#bioaccumulation.

Bore ID	Casing diameter (mm)	Water column (m)	Casing volume (L) (x3)	Volume purged (L)	Purged and sampled via
				74,059 (sample 2)	
MW83	147	17.3	293.7 (880.4)	430	Grundfos pump
MW84	50	12.4	24.3 (73.0)	90	Bailer
MW85	147	10.6	179.8 (539.4)	261	Grundfos pump
MW86	50	Bore dry	NA	NA	NA
MW89	50	4.1	8.0 (24.1)	42	Bailer
MW90	147	20.9	354.5 (1063.6)	2,000 (sample 1) 5,000 (sample 2)	Grundfos pump
MW91	50	8.8	17.3 (51.8)	16	Low-flow pump
MW94	50	15.9	31.2 (93.6)	95	Bailer
MW98	50	9.1	17.9 (53.6)	43 (purged dry)	Bailer

3.3 Groundwater sampling results

3.3.1 Physicochemical field vs laboratory parameters

The physicochemical parameters collected in the field and laboratory results are included in the results summary tables in Table B1 in Appendix C. A summary of pH and SPC/EC are provided in Table 3.3.

Table 3.3 Physicochemical field and laboratory parameters

Sample ID	Field pH	Lab pH	Field SPC	Lab EC
MW78_GW	7.03	8.17	11,408	11,600
MW81_PT_01	6.79	7.56	7,021	6,600
MW81_PT_02	6.76	7.44	7,062	6,640
MW82_PT_01	7.32	7.69	10,237	10,500
MW82_PT_02	7.29	7.93	10,099	10,200
MW83_PT_01	6.9	7.25	8,145	8,400
MW84_GW	6.73	7.33	5,836	5,560
MW85_GW	11.59	12.0	9,786	10,400
MW89_GW	6.8	7.30	7,928	7,620
MW90_PT_01	6.74	7.94	8,602	9,430
MW90_PT_02	6.76	7.90	8,570	9,120
MW91_GW	6.88	7.49	3,548	3,430
MW94_GW	7.07	7.65	11,437	11,300
MW98_GW	7.43	7.93	8,096	7,700

The field and laboratory reported pH for water from MW85 are inconsistent with the pH readings in all other sampled bores. It is noted that there was difficulty with the airlift development of MW85 due to the very low yield of the bore and not being able to lift all the water out of the bore (i.e., water was being pushed back into the screen) (refer to the GHD *Factual Bore Completion Report* for further details). The high pH is therefore likely a result of bentonite / grout contact with the water in the bore. The water quality results for MW85 should be treated with caution.

3.3.2 Laboratory analysis results

The analytical results for groundwater samples collected from the recovery and monitoring bores are presented in Table B1 in Appendix C. Major anions and cations and fluoride

Inorganic analytes

Suspended solids

Bores that had visible colouration and suspended solids during the purging process, reported total suspended solids in the laboratory results, ranging from 10 mg/L (MW85_GW) to 654 mg/L (MW98_GW).

pH

pH values were typically neutral for all samples, ranging from pH 6.73 to 7.43, except for MW85_GW which reported laboratory pH of 11.59. The very low yield in recovery bore MW85 did not allow for the bore to be developed well which may have attributed to this result.

Major ions

Major ions ionic balance ranged from 0.03 % (MW98_GW) and 5.51 % (MW85_GW), indicating that the majority of ions present in the samples are accounted for in the major ions and minor ions (fluoride). Piper tri-linear plot of the major ions is shown in Figure 3.1.

The laboratory reported results for MW85 showed elevated calcium, potassium, alkalinity (carbonate as $CaCO_3$ and hydroxide as $CaCO_3$) concentrations, which was greater than those reported in all the other sampled bores, indicating grout / bentonite contact with the bore water. The water quality results for MW85 should be treated with caution.

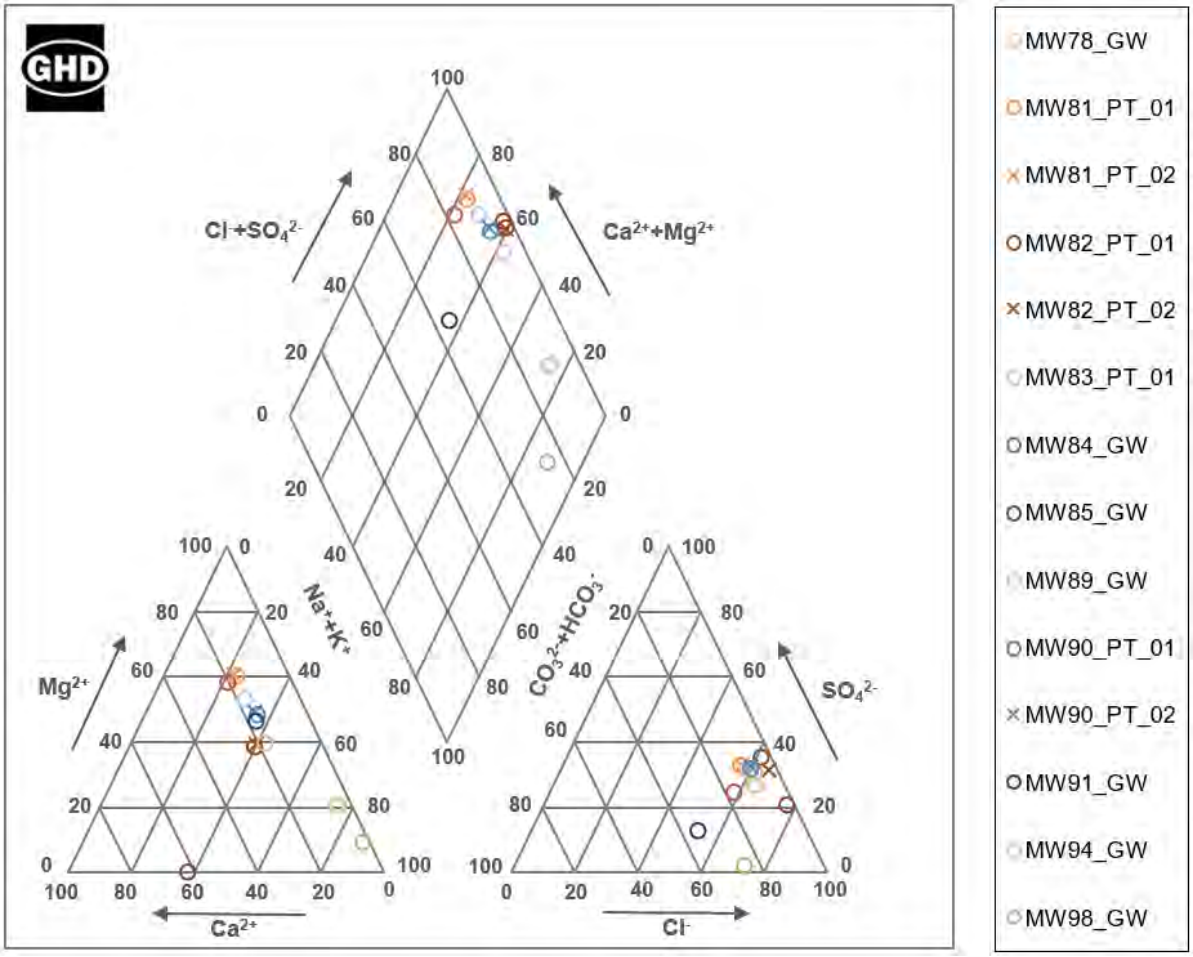


Figure 3.1 Piper tri-linear plot of major ions

Nutrient suite

Samples were analysed for nutrients and results are summarised as follows:

- Nitrate concentrations ranged from less than LOR (<0.01 mg/L) to 0.48 mg/L (MW98_GW).
- Nitrite ranged from less than LOR (<0.01 mg/L) to 0.01 mg/L (MW85_GW, MW89_GW, MW94_GW, MW98_GW).
- Ammonia concentrations ranged from 0.02 mg/L to 0.32 mg/L.
- Total nitrogen concentrations ranged from less than LOR (<0.01 mg/L) to 0.49 mg/L (MW98_GW).
- Reactive phosphorus ranged from less than LOR (0.01 mg/L) to 0.02 mg/L (MW94_GW).

One sample (MW85_GW) equalled the ANZG 2018 – FW 99% guideline value (0.32 mg/L) for ammonia as N. Laboratory analysis result interpretation from MW85_GW should be treated with caution.

Metals suite

Samples were analysed for total and dissolved iron and manganese. Results are summarised as follows and exceedances of the selected guidelines is given in Table 3.4:

- Total iron concentrations ranged from less than limit of reporting (LOR) of <0.05 mg/L to 1.39 mg/L (MW89_GW)
- All samples reported dissolved iron concentrations at less than LOR of <0.05 mg/L
- Total manganese concentrations ranged from less than LOR to 8.40 mg/L (MW82_PT_01)
- Dissolved manganese concentrations ranged from less than LOR of 0.001 mg/L to 8.05 mg/L (MW82_PT_01).

Table 3.4 Summary of samples with metals exceedances of the selected water quality guidelines

	Iron (mg/L)	Iron (filtered) (mg/L)	Manganese (mg/L)	Manganese (filtered) (mg/L)
ADWG 2011 Aesthetic (v3.7 updated 2022)	**0.3**	**0.3**	**0.1**	**0.1**
ADWG 2011 Health (v3.7 updated 2022)	–	–	**0.5**	**0.5**
ADWG 2011 Recreational (v3.7 updated 2022)	–	–	**5**	**5**
ANZG (2018) - FW - 99% (updated 26 July 2021)	–	–	**1.2**	**1.2**
Sample ID				
MW78_GW	**0.56**	–	–	–
MW82_PT_01	–	–	**8.40**	**8.05**
MW82_PT_02	–	–	**6.85**	**7.50**
MW83_PT_01	**0.72**	–	**1.12**	**1.30**
MW84_GW	**0.32**	–	–	–
MW89_GW	**1.39**	–	–	–
MW98_GW	**0.56**	–	**0.14**	**0.121**

Total organic fluorine

A total of 14 groundwater samples were collected and analysed for total organic fluorine (TOF). All results were below the LOR (20 µg/L), with the exception of MW84_GW (30 µg/L).

PFAS

A total of 14 groundwater samples were collected and analysed for PFAS super ultra-trace (full suite, 28 analytes). Samples that detected at least one PFAS compounds are listed in Table 3.6, with sum of PFHxS and PFOS

concentrations ranging from 0.0577 µg/L (MW78_GW) to 26.1 µg/L (MW84_GW), and the sum of total PFAS concentrations ranging from 0.0807 µg/L (MW82_PT_01) to 39.8 µg/L (MW84_GW).

The PFAS compounds detected include:

– Perfluorobutane sulfonic acid (PFBS) detected in 13 samples
– Perfluoropentane sulfonic acid (PFPeS) detected in 14 samples
– Perfluorohexane sulfonic acid (PFHxS) detected in 14 samples
– Perfluoroheptane sulfonic acid (PFHpS) detected in 14 samples
– Perfluorooctane sulfonic acid (PFOS) detected in 14 samples
– Perfluorobutanoic acid (PFBA) detected in 4 samples
– Perfluoropentanoic acid (PFPeA) detected in 3 samples
– Perfluorohexanoic acid (PFHxA) detected in 4 samples
– Perfluoroheptanoic acid (PFHpA) detected in 3 samples
– Perfluorooctanoic acid (PFOA) detected in 5 samples

Ten samples exceeded the most conservative nominated guideline (i.e., PFAS NEMP 2.0 Health Drinking Water) value for sum of PFHxS and PFOS (0.07 µg/L) with a maximum detected concentration of 26.1 µg/L (MW84_GW).

PFAS TOPA

A total of 14 groundwater samples were collected and analysed for PFAS low level TOPA (full suite, 28 analytes). Samples that detected PFAS TOPA are listed in Table 3.7 with sum of PFHxS and PFOS (TOPA) concentrations ranging from 0.050 µg/L (MW82_PT_02) to 23.6 µg/L (MW84_GW), and the sum of total PFAS (TOPA) concentrations ranging from 0.085 µg/L (MW82_PT_02) to 40.2 µg/L (MW84_GW).

The PFAS TOPA compounds detected include:

– PFBA (TOPA) detected in 7 samples
– PFPeA (TOPA) detected in 5 samples
– PFHxA (TOPA) detected in 14 sample
– PFHpA (TOPA) detected in 3 sample
– PFOA (TOPA) detected in 6 samples
– PFBS (TOPA) detected in 14 samples
– PFPeS (TOPA) detected in 14 samples
– PFHxS (TOPA) detected in 14 samples
– PFHpS (TOPA) detected in 9 samples
– PFOS (TOPA) detected in 14 samples

Eleven samples exceeded the most conservative nominated guideline (i.e., PFAS NEMP 2.0 Health Drinking Water) value for sum of PFHxS and PFOS (TOPA) (0.07 µg/L) with a maximum detected concentration of 23.6 µg/L (MW84_GW).

The PFAS NEMP 2.0 requires quality assurance when undertaking laboratory analysis of PFAS TOPA. A summary of the compliance objectives from the PFAS NEMP 2.0 and quality assurance results is provided in Table 3.5.

Table 3.5 Summary of PFAS TOPA QA/QC compliance

Item	Objective	Summary of Results	Compliance
Total PFAS concentration post-TOPA	Total PFAS concentration post-TOPA should be equal or greater than the total PFAS concentration pre-TOPA	All results of total PFAS post-TOPA were equal to or greater than that of the concentration pre-TOPA, with the exception of: – MW81_PT_01 (pre-TOPA 0.166 µg/L, post-TOPA 0.161 µg/L)	Yes – while there are some post-TOPA results that are less than the Sum of PFAS pre-TOPA, all results are within the 10% decrease that is

Item	Objective	Summary of Results	Compliance
		– MW85_GW (pre-TOPA 0.623 µg/L, post-TOPA 0.618 µg/L) – MW90_PT_01 (pre-TOPA 0.224 µg/L, post-TOPA 0.221 µg/L) – MW90_PT_02 (pre-TOPA 0.228 µg/L, post-TOPA 0.216 µg/L) – MW91_PT_01 (pre-TOPA 1.48 µg/L, post-TOPA 1.42 µg/L)	expected due to analytical variability.
Sum of PFCA post-TOPA	Sum PFCA concentration post-TOPA should be equal or greater than the total PFAS concentration pre-TOPA	All results of the sum PFCA post-TOPA were equal to or greater than that of the concentration pre-TOPA.	Yes
Sum of PFSA post-TOPA	Sum of PFSA post-TOPA should approximate the sum of PFSA pre-TOPA	All results for the sum of PFSA post-TOPA were within the approximate sum of the Pre-TOPA results (10%), with the exception of: – MW78_GW (pre-TOPA 0.0864 µg/L, post-TOPA 0.239 µg/L)	Yes – with the exception of MW78_GW
No PFAA precursors detectable post oxidation	No PFAA precursors detectable post oxidation	No PFAA precursors were detectable in samples.	Yes

The quality assurance assessment of the PFAS TOPA analysis above shows that all samples analysed for TOPA comply with the PFAS NEMP 2.0 quality assurance measures for TOPA, with the exception of MW78_GW (sum of PFSA post-TOPA).

Table 3.6 Summary of detected PFAS compounds in groundwater samples

	PFBS (µg/L)	PFPeS (µg/L)	PFHxS (µg/L)	PFHpS (µg/L)	PFOS (µg/L)	PFBA (µg/L)	PFPeA (µg/L)	PFHxA (µg/L)	PFHpA (µg/L)	PFOA (µg/L)	Sum PFHxS + PFOS (µg/L)	Sum Total PFAS (µg/L)
MW78_GW	0.0212	0.0059	0.0348	0.0011	0.0229	ND	ND	ND	ND	ND	0.0577	0.0859
MW81_PT_01	0.0169	0.011	0.0881	0.0037	0.0459	ND	ND	ND	ND	ND	0.134	0.166
MW81_PT_02	0.0329	0.0264	0.225	0.0083	0.0828	ND	ND	ND	ND	0.0023	0.308	0.378
MW82_PT_01	0.0141	0.0066	0.0368	ND	0.0232	ND	ND	ND	ND	ND	0.06	0.0807
MW82_PT_02	0.0139	0.0069	0.0396	ND	0.0223	ND	ND	ND	ND	ND	0.0619	0.0827
MW83_PT_01	0.0131	0.0087	0.0555	0.0025	0.0645	ND	ND	ND	ND	ND	0.12	0.144
MW84_GW	2.03	2.62	16.5	0.803	9.62	0.644	1.08	4.89	0.59	1.02	26.1	39.8
MW85_GW	0.0547	0.0531	0.343	0.0121	0.119	0.0309	ND	0.0022	ND	0.0084	0.462	0.623
MW89_GW	0.0282	0.0188	0.181	0.0069	0.0666	0.0142	0.0028	0.0121	0.0015	0.0042	0.248	0.336
MW90_PT_01	0.022	0.0128	0.118	0.0045	0.0667	ND	ND	ND	ND	ND	0.185	0.224
MW90_PT_02	0.0238	0.0135	0.118	0.0046	0.0684	ND	ND	ND	ND	ND	0.186	0.228
MW91_GW	0.113	0.146	0.825	0.023	0.0914	0.0777	0.0464	0.11	0.0189	0.0265	0.916	1.48
MW94_GW	0.0186	0.006	0.0338	0.0013	0.0265	ND	ND	ND	ND	ND	0.0603	0.0862
MW98_GW	ND	0.0054	0.0591	0.0015	0.04	ND	ND	ND	ND	ND	0.0991	0.106
Table notes: ND – not detected; units are µg/L												

Table 3.7 Summary of detected PFAS TOPA compounds in groundwater samples

	PFBA (TOPA) (µg/L)	PFPeA (TOPA) (µg/L)	PFHxA (TOPA) (µg/L)	PFHpA (TOPA) (µg/L)	PFOA (TOPA) (µg/L)	PFBS (TOPA) (µg/L)	PFPeS (TOPA) (µg/L)	PFHxS (TOPA) (µg/L)	PFHpS (TOPA) (µg/L)	PFOS (TOPA) (µg/L)	Sum of PFHxS + PFOS (TOPA) (µg/L)	Sum of PFAS (µg/L)
MW78_GW	ND	ND	0.015	ND	0.004	0.018	0.014	0.095	0.006	0.104	0.199	0.256
MW81_PT_01	ND	ND	0.007	ND	ND	0.013	0.012	0.073	0.003	0.053	0.126	0.161
MW81_PT_02	0.01	0.005	0.017	ND	0.004	0.029	0.032	0.2	0.007	0.102	0.302	0.406
MW82_PT_01	0.01	ND	0.006	ND	ND	0.013	0.008	0.033	ND	0.019	0.052	0.089
MW82_PT_02	0.01	ND	0.006	ND	ND	0.012	0.007	0.031	ND	0.019	0.05	0.085
MW83_PT_01	ND	ND	0.006	ND	ND	0.014	0.01	0.057	ND	0.058	0.115	0.145
MW84_GW	1.12	1.61	7.03	0.605	1.1	2.02	2.33	15.2	0.8	8.35	23.6	40.2
MW85_GW	0.03	0.004	0.012	ND	0.01	0.052	0.056	0.333	0.012	0.109	0.442	0.618
MW89_GW	0.02	0.007	0.02	0.002	0.005	0.029	0.029	0.182	0.007	0.055	0.237	0.356
MW90_PT_01	ND	ND	0.005	ND	ND	0.02	0.017	0.107	0.005	0.067	0.174	0.221
MW90_PT_02	ND	ND	0.005	ND	ND	0.02	0.018	0.106	0.004	0.063	0.169	0.216
MW91_GW	0.08	0.045	0.118	0.018	0.026	0.131	0.148	0.776	0.022	0.053	0.829	1.42
MW94_GW	ND	ND	0.005	ND	ND	0.015	0.008	0.037	ND	0.023	0.06	0.088
MW98_GW	ND	ND	0.01	ND	ND	0.004	0.006	0.067	ND	0.027	0.094	0.114
Table notes: ND – not detected; units are µg/L												

3.4 Quality assurance and quality control

QA/QC procedures were adopted during the fieldwork based on the minimum requirements detailed in the AS/NZS 5667.11 – 1998 (R2016), ASC NEPM and on the guidance given in the PFAS NEMP 2.0. The QA/QC system allows the collected data to be assessed and to provide evidence that the data is fit for interpretive use. QA/QC sampling was carried out by GHD field personnel during the groundwater sampling program.

3.4.1 Groundwater sampling program

3.4.1.1 Field procedures

– Field activities were compliant with GHD standard operating procedures (SOPs), which are in accordance with Australian standards, ASC NEPM and PFAS NEMP 2.0 guidance.
– Field activities were documented using standardised templates and GHD SOPs.
– Collected samples were immediately collected to laboratory-provided sample containers of appropriate type and preservation for the required laboratory analysis. All sample containers were clearly labelled with a sample number, project number, and sample date.
– A CoC form was completed and forwarded to the nominated NATA testing laboratory along with the associated samples.
– Field equipment (i.e., groundwater pump) was decontaminated according to GHD's decontamination procedure (Section 2.3)
– Duplicate samples were collected at a ratio of 1:10 samples.

3.4.1.2 Field QA/QC samples

Quality control samples (blind and split duplicate and their respective parent samples, rinsates and transport blanks) were collected during the program for the purposes of assessing the reproducibility of sample analysis results. The QA/QC samples collected during the program are as follows and details of individual samples collected are provided in Table 3.8.

– Field replicates (blind intra-laboratory and split inter-laboratory duplicates): blind and split duplicate samples were collected at a rate of 1 in 10 primary samples, with the blind sample being submitted to the primary laboratory (ALS) and the split being submitted to the secondary laboratory (Eurofins Environmental).
– Rinsate samples: Collected from sampling equipment following decontamination of the sampling pumps to check for potential cross-contamination from the sampling equipment. The rinsate samples were analysed for PFAS super ultra trace and PFAS low level TOPA. Five rinsate samples were collected.
– Field blank (PFAS): A sample of deionised water was collected in the field to demonstrate that samples were not contaminated during the sampling process. One field blank was collected during the field groundwater sampling program.
– Transport blank (PFAS): laboratory-prepared samples were provided by ALS. A transport blank was sent with batches of samples to the laboratory. Two samples were collected during the groundwater sampling program.

The blind and split duplicates and their respective parent samples, and rinsate samples are listed in Table 3.8, and the field blank and transport blank samples that were analysed are listed in Table 3.9.

Table 3.8 Summary of rinsates and field duplicate samples

Location ID	Rinsate sample (pump)	Duplicates		
		Parent sample	Blind (intra-laboratory)	Split (inter-laboratory)
MW81	RS02_GW (Grundfos)	–	–	–
MW82	RS01_GW (Grundfos)	MW82_PT_01	FD01_GW	FS01_GW
MW85	RS03_GW (Grundfos)	–	–	–
MW90	RS04_GW (Grundfos)	–	–	–

Location ID	Rinsate sample (pump)	Duplicates		
		Parent sample	Blind (intra-laboratory)	Split (inter-laboratory)
MW84	–	MW84_GW	FD02_GW	FS02_Gw
MW78	RS05_GW (QED Sample Pro)	–	–	–

Table 3.9 QA/QC blank samples analysis

Analysis	Field blank	Transport blank
PFAS super ultra trace (28 analytes)	FB01_GW FB02_GW	TB01_GW_210728 TB02_GW_210702 TB03_GW_210729

3.4.1.3 Field QA/QC sample results

Sample duplicates

The data quality indicator (DQI) for acceptable blind and split duplicates relative percent difference (RPD) are as follows:

– Concentration result of <10 x LOR = no RPD limit
– Concentration result of 10-20 x LOR = acceptable RPD range 0 – 50%
– Concentration result >20 x LOR = acceptable RPD range 0 – 20%.

A quantitative measure of the accuracy of the analytical results reported is made by calculating the RPDs between the primary, blind, and split results in accordance with the procedure described in DES *Monitoring and Sampling Manual* (2018).The duplicate blind and split analytical results are compared with the parent sample in Table A2 in Appendix C.

RPD exceedances were noted for sample analytes listed in Table 3.10. When interpreting the RPD exceedances, the following should be noted:

– RPD exceedance for metals is common, especially with total iron, as particulate matter can influence iron concentrations.
– The majority of the PFAS exceedances occurred for duplicate split samples (inter-laboratory), in particular samples from MW84, which were collected from a bailer. While all efforts were made to ensure sample homogeneity, the sample transfer process from multiple bailer volumes may have introduced some sample heterogeneity.

Table 3.10 RPD exceedances

Analyte	Sample type	Primary sample	Concentration	RPD	Comment
Total iron	Primary sample	MW84_GW	0.32 mg/L	–	Both duplicates exceeded the RPD limit. High RPDs can be common, especially with total iron, as particulate matter can influence iron concentrations
	Intra-lab duplicate	FD02_GW	<0.05 mg/L	146%	
	Inter-lab duplicate	FS02_GW	0.07 mg/L	128%	
Ammonia as N	Primary sample	MW82_PT_01	0.24 mg/L	–	Inter-laboratory sample (Eurofins) reported an exceedance of the RPD limit. Reason for RPD exceedance is unknown.
	Intra-lab duplicate	FD01_GW	0.20 mg/L	18%	
	Inter-lab duplicate	FS01_GW	0.06 mg/L	120%	
Fluoride	Primary sample	MW82_PT_01	1.6 mg/L	–	Inter-laboratory sample (Eurofins) reported an exceedance of the RPD limit. Limit of reporting is 0.5 mg/L, and RPDs can exceed given the low values.
	Intra-lab duplicate	FD01_GW	1.6 mg/L	0%	
	Inter-lab duplicate	FS01_GW	<0.5 mg/L	105%	
PFPeS	Primary sample	MW84_GW	2.62 µg/L	–	

Analyte	Sample type	Primary sample	Concentration	RPD	Comment
	Intra-lab duplicate	FD02_GW	2.36 µg/L	10%	Inter-laboratory sample (Eurofins) reported an exceedance of the RPD limit. Eurofins analysis notes: "*Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard*", which may account for the difference.
	Inter-lab duplicate	FS02_GW	1.4 µg/L	61%	
PFHxS	Primary sample	MW82_PT_01	0.0368 µg/L	–	Inter-laboratory sample (Eurofins) reported an exceedance of the RPD limit. Eurofins analysis notes: "*Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard*", which may account for the difference.
	Intra-lab duplicate	FD01_GW	0.0376 µg/L	2%	
	Inter-lab duplicate	FS01_GW	0.050 µg/L	30%	
PFHpS	Primary sample	MW84_GW	0.803 µg/L	–	Both duplicates exceeded the RPD limit. Reason for RPD exceedance is unknown.
	Intra-lab duplicate	FD02_GW	1.28 µg/L	46%	
	Inter-lab duplicate	FS02_GW	1.4 µg/L	54%	
PFOS	Primary sample	MW84_GW	9.62 µg/L	–	Inter-laboratory sample (Eurofins) reported an exceedance of the RPD limit. Eurofins analysis notes: "*Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard*", which may account for the difference.
	Intra-lab duplicate	FD02_GW	9.82 µg/L	2%	
	Inter-lab duplicate	FS02_GW	15.0 µg/L	44%	
PFPeA	Primary sample	MW84_GW	1.08 µg/L	–	Inter-laboratory sample (Eurofins) reported an exceedance of the RPD limit. Reason for RPD exceedance is unknown.
	Intra-lab duplicate	FD02_GW	1.14 µg/L	5%	
	Inter-lab duplicate	FS02_GW	0.68 µg/L	45%	
PFHpS (TOPA)	Primary sample	MW84_GW	0.800 µg/L	–	Intra-laboratory sample (ALS) reported an exceedance of the RPD limit. Reason for RPD exceedance is unknown.
	Intra-lab duplicate	FD02_GW	1.12 µg/L	33%	
	Inter-lab duplicate	FS02_GW	0.90 µg/L	12%	

Rinsate samples

All rinsate samples were taken from the decontaminated Grundfos pump during the pumping tests and the QED Sample Pro pump during low-flow sampling.

Rinsate samples were analysed for the same parameters as the parent samples (analytical schedule listed in Table 2.4). Laboratory results for the rinsate samples are tabulated in Table B2 in Appendix C. Some trace exceedances were detected for some of the analytes, outlined in Table 3.11.

Table 3.11 Detected analytes in rinsate samples

Sample ID	EC (uS/cm)	TDS (mg/L)	TSS (mg/L)	Bicarbonate as CaCO3 (mg/L)	Iron (mg/L)	Ammonia as N (mg/L)	PFOS (µg/L)
RS01_GW	ND	ND	8	2	ND	ND	ND
RS02_GW	1	ND	ND	2	ND	ND	0.0003
RS03_GW	ND	ND	ND	2	ND	ND	ND
RS04_GW	3	2	ND	3	0.06	ND	ND
RS05_GW	ND	ND	ND	3	ND	0.03	ND

Detected analytes were generally less than 2 x the LOR, indicating trace amounts. Based on the results it is considered that no cross-contamination of samples occurred during the sampling of each location. The detected PFOS concentration for rinsate sample RS02_GW a query has been lodged with the laboratory at the time of report preparation and are awaiting a response. There are cases where a false positive is detected in lab results when using super trace LOR.

Transport blank samples

All transport blank samples reported concentrations of PFAS at below the LOR (refer to Table B3 Appendix C) and as such no cross-contamination of samples was introduced during the sample preparation activities or sample transportation to the laboratory.

3.4.2 Laboratory QA/QC procedures and reporting

ALS is NATA-accredited for the analyses performed. The internal laboratory QC results are summarised in Section 3.4.2.1 and the laboratory certificates are included in Appendix D. Laboratory analysis precision and accuracy were assessed by calculating the RPD between the primary and the duplicate samples.

3.4.2.1 Laboratory QA/QC results

The laboratory QC reports (Table 3.12) for the water sample analysis reported the following:

– Analysis holding time outliers existed for some samples
– No method blank value outliers occurred
– One laboratory control outlier occurred
– No duplicate outliers occurred
– Some matrix spike outliers occurred
– For all regular sample matrices, no surrogate recovery outliers occurred
– Some raised LORs occurred

Refer to laboratory Quality Control Interpretation reports in Appendix D for the results of the outliers.

Based on the laboratory QC results, the analytical results are considered to be appropriate.

Table 3.12 Summary of laboratory quality control sample analysis outliers for water samples analysis

Work order	Analysis holding time outliers	Method blank outliers	Laboratory control outliers	Duplicate RPD outliers	Matrix spike outliers	Surrogate recovery
EB2323957	pH, nitrite, reactive P	None	None	None	None	None
EB2324241	pH, nitrite, reactive P	None	None	None	Sulfate, chloride, ammonia (1)	None

Work order	Analysis holding time outliers	Method blank outliers	Laboratory control outliers	Duplicate RPD outliers	Matrix spike outliers	Surrogate recovery
EB2324549	pH, total hardness, major cations, nitrite, reactive P	None	None	None	Total metals (Mn) (1)	None
EB2325013	pH, total hardness, major cations, nitrite, reactive P	None	10:2 FTS (2)	None	Sulfate, chloride (1) 10:2 FTS (3)	None
EB2325216	pH, total hardness, major cations, nitrite, reactive P	None	None	None	Sulfate, chloride, ammonia (1)	None

Table notes:

1. MS recovery not determined, background levels greater than or equal to 4x spike level
2. Recovery greater than upper control limit
3. Recovery greater than upper data quality objective

Table 3.13 Summary of samples with raised LORs

Analyte	Matrix interference – raised LOR	Dilution due to presence of high contaminant levels – raised LOR	Diluted due to matrix interference – raised LOR
PFAS super ultra trace	MW81_PT_01 MW81_PT_02 MW90_PT_01 MW90_PT_02 MW85_GW MW91_GW	MW84_GW FD02_GW	MW82_PT_01 MW82_PT_02 FD01_GW
PFAS low-level TOPA	–	MW84_GW FD02_GW	–
Reactive phosphorous as P	–	–	MW85_GW
Ammonia as N	–	–	RS04_GW

4. Conclusion

Groundwater sampling was completed on each of the newly installed recovery bores and groundwater monitoring bores, except for MW86 which was dry. Additionally, one existing groundwater monitoring bore (MW78) was also sampled.

Field physicochemical parameters were recorded, and samples analysed by a NATA accredited laboratory for a range of analytes including pH, EC, TDS, major ions, alkalinity, hardness, total and dissolved iron and manganese, nutrients, PFAS, PFAS TOPA, and TOF. Field and laboratory results are tabulated in summary tables included in Appendix B.

Bore MW84 reported PFAS (Sum of PFHxS & PFOS) and PFAS TOPA (Sum of PFHxS & PFOS) (TOPA) concentrations two-orders of magnitude greater than results from the other sampled bores. A blind duplicate (intra-laboratory) and split duplicate (inter-laboratory) were also collected from MW84 and both the duplicate laboratory analysis reported similar elevated PFAS concentrations. It is recommended that MW84 is sampled and analysed again to confirm the results.

The field recorded and laboratory reported pH results were elevated and inconsistent with the water quality results of the other sampled bores. Additionally, the calcium, potassium, carbonate and hydroxide alkalinity concentrations were also elevated indicating grout / bentonite contact with the bore water. MW85 would benefit from further development effort.

5. References

ANZG 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia

Department of Environmental and Science (DES) 2018. *Monitoring and sampling manual: Environmental Protection (Water) Policy*. Brisbane: Department of Environment and Science Government.

GHD, 2023a. *Callide Groundwater Bore Drilling Project, Factual Bore Completion Report*

GHD, 2023b. *Callide Groundwater Bore Drilling Project, Soil Sampling Report*

GHD, 2023c. *Callide Groundwater Bore Drilling Project, Groundwater Sampling Report*

GHD, 2023d. *Callide Groundwater Bore Drilling Project, Drilling, Testing, and Sampling Plan*

National Chemicals Working Group of the Heads of EPAs Australia and New Zealand (HEPA), 2020. *PFAS National Environmental Management Plan – Version 2.0,* Heads of EPA Australia and New Zealand 2020

National Environment Protection Council (NEPC), 2013. *National Environment Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM, as amended 2013)

National Health and Medical Research Council (NHMRC), Natural Resource Management Ministerial Council (NRMMC), 2011. *Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy*. National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra.

Standards Australia, 2016. Australian/New Zealand Standard (AS/NZS) 5667.11 – 1998 (R2016) *Water Quality – Sampling – Part 11: Guidance on sampling of groundwaters*

Appendix A

YSI calibration certificate

Multi Parameter Water Meter

Instrument **YSI Quatro Pro Plus**
Serial No. **18J104324**

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00	**NIST**	393774	pH 7.01
2. pH 4.00		pH 4.00	**NIST**	329384	pH 4.01
3. mV		232.96mV	**NIST**	385070/387761	233.18mV
4. EC		2760uS	**NIST**	385789	2760uS
5. D.O		100%	**NIST**		99.4% - 755.6mmHg
6. Temp		23.2°C	**NIST**	MultiTherm 09000528	23.1°C

Calibrated by: **Leonard Westerman-Cox**

Calibration date: **29-Jun-23**

Next calibration due: **26-Dec-23**

Appendix B

Groundwater purging and sampling sheets

Groundwater purging and sampling

Bore ID: MW78

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**F. Manca and M. Prskalo**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.305	**SWL (m bTOC)**	9.267	**Purge method**	Low flow
Screen interval (m bgl)	Unknown	**Date & Time**	14/08/2023	**Water level method**	Interface meter
Total bore depth (m bgl)	23.5 m bTOC	**Min. purge volume (L)**	NA	**Sample method**	Low flow
Casing internal diameter (mm)	147	**Bore condition**	Good, cap secure	**QA sample collected? ID**	No

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
14/08/2023 9:00										QED Sample Pro pump set at 20.0 m bTOC
										Trouble with MP10 controller (short-circuit). Requested replacement from Airmet.
15/08/2023 10:50										Started purging. Low flow pump setting: 44 PSI, CPM 6
15/08/2023 11:11	8	24.7	4.26	11419			7.06	108.8	24.8	SWL 9.264 m bTOC. Clear, no odour
15/08/2023 11:17	10	30.2	2.59	11420			7.04	108.2	24.8	SWL 9.263 m bTOC. Clear, no odour
15/08/2023 11:22	12	33.7	2.78	11412			7.03	107.2	25.0	SWL 9.263 m bTOC. Clear, no odour
15/08/2023 11:28	15	25.2	2.11	11408			7.03	105.6	25.0	SWL 9.263 m bTOC. Clear, no odour
										Sample taken 15/08/2023 at 11:30am

Groundwater purging and sampling

Bore ID: MW81

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**M. Prskalo**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.474	**SWL (m bTOC)**	9.16	**Purge method**	Submersible Pump (Grundfos)
Screen interval (m bgl)	16-22	**Date & Time**	4/08/2023	**Water level method**	Interface Meter
Total bore depth (m bgl)	22.06	**Min. purge volume (L)**	Not applicable	**Sample method**	Submersible Pump (Grundfos)
Casing internal diameter (mm)	147	**Bore condition**	New	**QA sample collected? ID**	No

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
4/08/2023 8:10	-	-	0.06	7020	-	-	6.78	-159.3	23.6	Clear, no odour
4/08/2023 8:30	-	-	2.08	7031	-	-	6.78	-225.1	23.6	Clear, no odour
4/08/2023 9:00	5881	-	2.23	7021	-	-	6.79	-273.5	23.2	Clear, no odour. Sample MW81_PT_01 collected.
4/08/2023 9:30	-	-	2.21	7034	-	-	6.78	-296.6	23.8	Clear, no odour
4/08/2023 10:00	-	-	2.16	7039	-	-	6.78	-313.0	24.1	Clear, no odour
4/08/2023 11:00	-	-	2.07	7044	-	-	6.77	-372.6	24.4	Clear, no odour
4/08/2023 11:40	-	-	2.09	7052	-	-	6.77	-403.2	24.6	Clear, no odour
4/08/2023 12:30	-	-	2.11	7059	-	-	6.77	-424.7	24.8	Clear, no odour
4/08/2023 13:00	-	-	2.15	7056	-	-	6.77	-429.8	24.8	Clear, no odour
4/08/2023 13:30	-	-	2.23	7056	-	-	6.77	-437.5	24.8	Clear, no odour
4/08/2023 14:00	-	-	2.29	7053	-	-	6.77	-436.2	25.0	Clear, no odour
4/08/2023 14:30	-	-	2.46	7067	-	-	6.77	-441.5	25.0	Clear, no odour
4/08/2023 15:00	-	-	2.93	7063	-	-	6.76	-491.9	25.0	Clear, no odour
4/08/2023 15:30	45987	-	2.81	7062	-	-	6.76	-517.8	25.1	Clear, no odour. Sample MW81_PT_02 collected.

Groundwater purging and sampling

Bore ID: MW82

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**M. Prskalo**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.519	**SWL (m bTOC)**	7.88	**Purge method**	Submersible Pump (Grundfos)
Screen interval (m bgl)	17-24	**Date & Time**	7/08/2023	**Water level method**	Interface Meter
Total bore depth (m bgl)	24	**Min. purge volume (L)**	Not applicable	**Sample method**	Submersible Pump (Grundfos)
Casing internal diameter (mm)	147	**Bore condition**	New	**QA sample collected? ID**	Yes. FD01_GW and FS01_GW

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
7/08/2023 7:50	-	-	0.06	10360	-	-	7.36	130.2	23.8	Very clean water, no odour
7/08/2023 8:10	-	-	0.13	10304	-	-	7.35	112	23.7	Clear, no odour
7/08/2023 8:20	-	-	0.37	10289	-	-	7.35	105.7	23.8	Clear, no odour
7/08/2023 8:30	-	-	0.43	10277	-	-	7.34	101	23.8	Clear, no odour
7/08/2023 8:40	-	-	0.46	10270	-	-	7.34	96.1	23.7	Clear, no odour
7/08/2023 8:55	-	-	0.48	10259	-	-	7.34	89.4	23.7	Clear, no odour
7/08/2023 9:20	17190	-	0.5	10248	-	-	7.33	80.6	23.9	Clear, no odour. Water sample MW82_PT_01 taken. Duplicate samples collected (FD01_GW abd FS01_GW)
7/08/2023 9:40	-	-	0.5	10237	-	-	7.32	73	24.1	Clear, no odour
7/08/2023 10:00	-	-	0.51	10228	-	-	7.32	62.1	24.2	Clear, no odour
7/08/2023 10:20	-	-	0.51	10226	-	-	7.32	47.9	24.2	Clear, no odour
7/08/2023 11:00	-	-	0.52	10210	-	-	7.31	1.4	24.3	Clear, no odour
7/08/2023 11:30	-	-	0.53	10193	-	-	7.3	-181	24.5	Clear, no odour
7/08/2023 13:00	-	-	0.54	10162	-	-	7.3	-360.6	24.6	Clear, no odour
7/08/2023 13:30	-	-	0.55	10152	-	-	7.29	-520.8	24.7	Clear, no odour
7/08/2023 14:00	-	-	0.55	10143	-	-	7.29	-510.8	24.7	Clear, no odour
7/08/2023 15:00	-	-	0.56	10123	-	-	7.29	-509.7	24.5	Clear, no odour
7/08/2023 15:30	-	-	0.57	10111	-	-	7.27	-521.8	24.5	Clear, no odour

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
7/08/2023 16:00	74059	-	0.58	10099	-	-	7.29	-501.9	24.2	Clear, no odour. Water sample MW82_PT_02 taken
7/08/2023 16:30	-	-	0.58	10081	-	-	7.29	-461.5	24.1	Clear, no odour
7/08/2023 17:00	82582	-	0.57	10083	-	-	7.29	-453.3	24.1	Clear, no odour

Groundwater purging and sampling

Bore ID: MW83

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**B. Llewellyn**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.499	**SWL (m bTOC)**	6.22	**Purge method**	Submersible Pump (Grundfos)
Screen interval (m bgl)	17-23	**Date & Time**	2/08/2023	**Water level method**	Interface Meter
Total bore depth (m bgl)	23	**Min. purge volume (L)**	Not applicable	**Sample method**	Submersible Pump (Grundfos)
Casing internal diameter (mm)	147	**Bore condition**	New	**QA sample collected? ID**	No

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
2/08/2023 8:20	-	-	3.72	8187	-	-	6.92	-80.0	22.8	Brown colour water, suspended solids, no odour
2/08/2023 8:40	-	-	2.65	8173	-	-	6.90	-153.6	22.7	Slight coloured water, trace suspended solids, no odour
2/08/2023 8:50	430	-	2.34	8159	-	-	6.90	-148.1	22.8	Water sample MW83_PT_01 taken
2/08/2023 9:10	-	-	2.15	8145	-	-	6.90	-144.3	22.9	Slight coloured water, trace suspended solids, no odour
2/08/2023 9:40	-	-	1.9	8168	-	-	6.90	-190.6	23.0	Slight coloured water, trace suspended solids, no odour
2/08/2023 10:10	-	-	1.86	8172	-	-	6.90	-216.0	23.1	Slight coloured water, trace suspended solids, no odour
2/08/2023 10:40	-	-	1.81	8171	-	-	6.90	-259.2	23.1	Slight coloured water, trace suspended solids, no odour
2/08/2023 11:10	-	-	1.95		-	-	6.91	-225.9	22.5	Slight coloured water, trace suspended solids, no odour
2/08/2023 11:40	2182	-	1.74	8179	-	-	6.91	-213.0	22.6	Slight coloured water, trace suspended solids, no odour. Purging stopped due to approaching thunderstorm.

Groundwater purging and sampling

Bore ID: MW84

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**F. Manca and M. Prskalo**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.68	**SWL (m bTOC)**	6.321	**Purge method**	Bailer
Screen interval (m bgl)	12-18	**Date & Time**	14/08/2023	**Water level method**	Interface meter
Total bore depth (m bgl)	18	**Min. purge volume (L)**	73 (3 x casing volume)	**Sample method**	Bailer
Casing internal diameter (mm)	50	**Bore condition**	New	**QA sample collected? ID**	Yes. FD02_GW, FS02_GW

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
14/08/2023 14:58	10	41.5	3.27	5580			7	75.2	25.1	Clear, no odour
14/08/2023 15:03	20	19.8	1.6	5836			6.75	67.2	24.5	Clear, no odour
14/08/2023 15:08	30	14.8	1.21	5895			6.72	58.5	24.7	Clear, no odour
14/08/2023 15:13	40	12.1	0.98	5863			6.7	55.1	24.6	Clear, no odour
14/08/2023 15:19	50	10.2	0.84	5850			6.7	52.7	24.6	Clear, no odour
14/08/2023 15:24	60	17.2	1.42	5843			6.74	51	24.5	Clear, no odour
14/08/2023 15:29	70	15.2	1.25	5838			6.72	50	24.5	Clear, no odour
14/08/2023 15:33	80	12.4	1.02	5836			6.72	49.8	24.5	Clear, no odour
14/08/2023 15:39	90	14.8	1.18	5836			6.73	48.8	25.9	Clear, no odour
										Sampled via bailer @ 15:45 - 16:10
										QA samples collected: FD02_GW, FS02_GW

Groundwater purging and sampling

Bore ID: MW85

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**M. Prskalo**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.712	**SWL (m bTOC)**	6.09	**Purge method**	Submersible Pump (Grundfos)
Screen interval (m bgl)	10-16	**Date & Time**	8/08/2023	**Water level method**	Interface Meter
Total bore depth (m bgl)	16	**Min. purge volume (L)**	Not applicable	**Sample method**	Bailer
Casing internal diameter (mm)	147	**Bore condition**	New	**QA sample collected? ID**	No

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
8/08/2023 10:25	-	-	-	-	-	-	-	-	-	Purging commenced 10:25
8/08/2023 10:36	-	-	1.92	13,111	-	-	13.05	-169.2	24.0	Brown colour water, suspended solids, no odour
8/08/2023 10:40	-	-	1.89	13,070	-	-	13.05	-168.5	24.0	Slight coloured water, trace suspended solids, no odour
8/08/2023 10:41	-	-	-	-	-	-	-	-	-	Bore purged dry after 16 mins (pumping at 0.1 L/s). Pump shut off.
-	-	-	-	-	-	-	-	-	-	-
14/08/2023 0:00	-	-	2.56	9,786	-	-	11.59	45.2	24.5	SWL 6.110 m bTOC. Groundwater sample (MW85_GW) collected via bailer on 14/08/2023

Groundwater purging and sampling

Bore ID: MW89

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**F. Manca and M. Prskalo**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.675	**SWL (m bTOC)**	7.528	**Purge method**	Bailer
Screen interval (m bgl)	5-11m	**Date & Time**	15/08/2023	**Water level method**	Interface meter
Total bore depth (m bgl)	11.83 m BTOC	**Min. purge volume (L)**	26 (3 x casing volumes)	**Sample method**	Bailer
Casing internal diameter (mm)	50	**Bore condition**	New	**QA sample collected? ID**	No

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
15/08/2023 13:10	10	21.2	1.74	7967			6.78	109	24.4	Brown-red, high suspended solids content, no odour
15/08/2023 13:15	18	21.5	1.77	7929			6.81	103	23.4	Brown-red, high suspended solids content, no odour
15/08/2023 13:20	26	19.8	1.63	7926			6.80	102.9	23.6	Brown-red, high suspended solids content, no odour
15/08/2023 13:25	34	18.7	1.55	7926			6.79	99.8	23.5	Brown-red, moderate suspended solids content, no odour
15/08/2023 13:30	42	22.5	1.85	7928			6.80	96.6	23.5	Brown-red, moderate high suspended solids content, no odour
										Bore allowed to rest for 15 min to allow suspended solids to settle
										Sample taken via bailer 15/08/2023 at 13:45

Groundwater purging and sampling

Bore ID: MW90

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**M. Prskalo**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.636	**SWL (m bTOC)**	6.69	**Purge method**	Submersible Pump (Grundfos)
Screen interval (m bgl)	21-27	**Date & Time**	10/08/2023	**Water level method**	Interface Meter
Total bore depth (m bgl)	27	**Min. purge volume (L)**	Not applicable	**Sample method**	Submersible Pump (Grundfos)
Casing internal diameter (mm)	147	**Bore condition**	New	**QA sample collected? ID**	No

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
10/08/2023 8:20	-	-	1.34	8585	-	-	6.8	46.7	23.4	Slight brown colouring, slight suspended solids, no odour
10/08/2023 8:30	-	-	1.38	8595	-	-	6.76	72.1	23.6	Slight brown colouring, slight suspended solids, no odour
10/08/2023 8:40	-	-	1.94	8598	-	-	6.79	78.1	23.5	Slight brown colouring, no odour
10/08/2023 8:50	-	-	2.25	8592	-	-	6.74	81.6	23.5	Slight brown colouring, no odour
10/08/2023 9:05	-	-	2.3	8601	-	-	6.74	87.4	23.6	Slight brown colouring, no odour
10/08/2023 9:30	-	-	2.25	8598	-	-	6.74	96.9	23.8	Slight brown colouring, no odour
10/08/2023 9:40	-	-	2.23	8598	-	-	6.74	97.6	23.9	Slight brown colouring, no odour
10/08/2023 9:50	-	-	2.18	8595	-	-	6.74	98.2	23.8	Slight brown colouring, no odour
10/08/2023 10:00	986	-	2.19	8593	-	-	6.74	98.5	23.8	Slight brown colouring, no odour
10/08/2023 10:10	-	-	2.18	8586	-	-	6.74	99.2	23.8	Slight brown colouring, no odour
10/08/2023 10:20	-	-	2.17	8591	-	-	6.74	98.8	23.8	Clear, no odour
10/08/2023 10:30	-	-	2.13	8605	-	-	6.74	98.9	23.9	Clear, no odour
10/08/2023 10:45	-	-	2.15	8599	-	-	6.74	98.7	24.1	Clear, no odour
10/08/2023 11:00	-	-	2.16	8600	-	-	6.74	98.6	24.1	Clear, no odour
10/08/2023 11:10	-	-	2.19	8602	-	-	6.74	97.4	24.1	Clear, no odour. Samples started being collected at 11:18, finished at 11:23 (Sample ID: MW90_PT_01)
10/08/2023 11:20	-	-	2.15	8598	-	-	6.74	96.1	24.4	Clear, no odour
10/08/2023 11:30	-	-	2.16	8596	-	-	6.74	95.2	24.1	Clear, no odour

			NA	Inorganics				Acidity & Alkalinity					Major Ions								Metals		Organic Fluorine
			Phosphorus reactive (as P)	pH (Lab)	Electrical conductivity (lab)	Total Dissolved Solids (est.)	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Hardness as CaCO3 (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Chloride	Fluoride	Cations Total	Anions Total	Iron	Manganese	Total Organic Fluorine
			MG/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	mg/L	µg/L
EQL			0.01	0.01	1	1	5	1	1	1	1	1	1	1	1	1	1	0.1	0.01	0.01	0.05	0.01	20
Field ID	**Date**	**Lab Report Number**																					
FB01_GW	07 Aug 2023	EB2325013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FB02_GW	10 Aug 2023	EB2325013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RS01_GW	07 Aug 2023	EB2324549	<0.01	**5.89**	<1	<1	**8**	<1	**2**	<1	**2**	<1	<1	<1	<1	<1	<1	<0.1	<0.01	**0.04**	<0.05	<0.01	<20
RS02_GW	05 Aug 2023	EB2324549	<0.01	**5.69**	**1**	<1	<5	<1	**2**	<1	**2**	<1	<1	<1	<1	<1	<1	<0.1	<0.01	**0.04**	<0.05	<0.01	-
RS03_GW	09 Aug 2023	EB2324549	<0.01	**6.14**	<1	<1	<5	<1	**2**	<1	**2**	<1	<1	<1	<1	<1	<1	<0.1	<0.01	**0.04**	<0.05	<0.01	<20
RS04_GW	11 Aug 2023	EB2325013	<0.01	**6.13**	**3**	**2**	<5	<1	**3**	<1	**3**	<1	<1	<1	<1	<1	<1	<0.1	<0.01	**0.06**	**0.06**	<0.01	<20
RS05_GW	14 Aug 2023	EB2325216	<0.01	**5.98**	<1	<1	<5	<1	**3**	<1	**3**	<1	<1	<1	<1	<1	<1	<0.1	<0.01	**0.06**	<0.05	<0.01	<20
TB01_GW_210728	07 Aug 2023	EB2324549	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TB02_GW_210702	10 Aug 2023	EB2325013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TB03_GW_210729	14 Aug 2023	EB2325216	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids												PFAS - Perfluoroalkyl Sulfonamide				
			Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.001	0.0005	0.001
Field ID	**Date**	**Lab Report Number**																							
FB01_GW	07 Aug 2023	EB2325013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
FB02_GW	10 Aug 2023	EB2325013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS01_GW	07 Aug 2023	EB2324549	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS02_GW	05 Aug 2023	EB2324549	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RS03_GW	09 Aug 2023	EB2324549	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS04_GW	11 Aug 2023	EB2325013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS05_GW	14 Aug 2023	EB2325216	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
TB01_GW_210728	07 Aug 2023	EB2324549	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
TB02_GW_210702	10 Aug 2023	EB2325013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
TB03_GW_210729	14 Aug 2023	EB2325216	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001

					PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums			PFAS TOPA - Perfluoroalkyl Carboxylic Acids											PFAS T	
			N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	PFBA (TOPA)	PFPeA (TOPA)	PFHxA (TOPA)	PFHpA (TOPA)	PFOA (TOPA)	PFNA (TOPA)	PFDA (TOPA)	PFUnDA (TOPA)	PFDoDA (TOPA)	PFTrDA (TOPA)	PFTeDA (TOPA)	PFBS (TOPA)	PFPeS (TOPA)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.001	0.0005	0.001	0.001	0.001	0.001	0.0002	0.0002	0.0002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.002
Field ID	**Date**	**Lab Report Number**																						
FB01_GW	07 Aug 2023	EB2325013	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-
FB02_GW	10 Aug 2023	EB2325013	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-
RS01_GW	07 Aug 2023	EB2324549	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS02_GW	05 Aug 2023	EB2324549	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RS03_GW	09 Aug 2023	EB2324549	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS04_GW	11 Aug 2023	EB2325013	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS05_GW	14 Aug 2023	EB2325216	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
TB01_GW_210728	07 Aug 2023	EB2324549	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-
TB02_GW_210702	10 Aug 2023	EB2325013	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-
TB03_GW_210729	14 Aug 2023	EB2325216	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-

			OPA - Perfluoroalkyl Sulfonic Acids				PFAS TOPA - Perfluoroalkyl Sulfonamide							PFAS TOPA - Fluorotelomer Sulfonic Acids				PFAS TOPA - Sums			
			PFHxS (TOPA)	PFHpS (TOPA)	PFOS (TOPA)	PFDS (TOPA)	FOSA (TOPA)	MeFOSA (TOPA)	EtFOSA (TOPA)	MeFOSAA (TOPA)	MeFOSE (TOPA)	EtFOSE (TOPA)	EtFOSAA (TOPA)	4:2 FTS (TOPA)	6:2 FTS (TOPA)	8:2 FTS (TOPA)	10:2 FTS (TOPA)	Sum of PFHxS and PFOS (TOPA)	Sum of PFAS	Sum of TOP C4 - C14 as Fluorine	Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfo_
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.002	0.005	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.002	0.002
Field ID	**Date**	**Lab Report Number**																			
FB01_GW	07 Aug 2023	EB2325013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FB02_GW	10 Aug 2023	EB2325013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RS01_GW	07 Aug 2023	EB2324549	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS02_GW	05 Aug 2023	EB2324549	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RS03_GW	09 Aug 2023	EB2324549	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS04_GW	11 Aug 2023	EB2325013	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS05_GW	14 Aug 2023	EB2325216	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
TB01_GW_210728	07 Aug 2023	EB2324549	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TB02_GW_210702	10 Aug 2023	EB2325013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TB03_GW_210729	14 Aug 2023	EB2325216	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
10/08/2023 11:40	-	-	2.14	8605	-	-	6.73	95.4	24.5	Clear, no odour
10/08/2023 12:00	2086	-	2.21	8604	-	-	6.74	94	24.5	Clear, no odour
10/08/2023 12:20	-	-	2.19	8604	-	-	6.74	93.8	24.3	Clear, no odour
10/08/2023 12:30	-	-	2.22	8600	-	-	6.74	92.5	24.2	Clear, no odour
10/08/2023 12:45	-	-	2.24	8593	-	-	6.74	91.9	24.2	Clear, no odour
10/08/2023 13:00	-	-	2.26	8595	-	-	6.74	90.7	24.2	Clear, no odour
10/08/2023 13:20	2760	-	2.3	8591	-	-	6.74	89.9	24.1	Clear, no odour
10/08/2023 13:30	-	-	2.29	8590	-	-	6.74	88.6	24.1	Clear, no odour
10/08/2023 13:40	-	-	2.32	8591	-	-	6.75	90.7	24	Clear, no odour
10/08/2023 13:50	-	-	2.32	8589	-	-	6.74	92.1	24	Clear, no odour
10/08/2023 14:00	-	-	2.35	8579	-	-	6.75	94.9	24	Clear, no odour
10/08/2023 14:10	-	-	2.38	8572	-	-	6.75	95.7	24	Clear, no odour. Sample MW90_PT_02 taken at 16:15
10/08/2023 14:20	-	-	2.35	8576	-	-	6.75	95.7	24	Clear, no odour
10/08/2023 14:30	-	-	2.36	8571	-	-	6.75	95.4	24.4	Clear, no odour
10/08/2023 14:50	-	-	2.35	8568	-	-	6.75	94.4	24.2	Clear, no odour
10/08/2023 15:15	-	-	2.31	8579	-	-	6.75	93.4	23.8	Clear, no odour
10/08/2023 15:35	-	-	2.33	8564	-	-	6.76	95.7	23.7	Clear, no odour
10/08/2023 15:45	-	-	2.33	8563	-	-	6.76	96.5	23.6	Clear, no odour
10/08/2023 15:55	-	-	2.34	8574	-	-	6.75	96.6	23.9	Clear, no odour
10/08/2023 16:30	-	-	2.32	8570	-	-	6.76	92.9	23.8	Clear, no odour
10/08/2023 17:00	5402	-	2.33	8569	-	-	6.76	95.4	23.6	Clear, no odour

Groundwater purging and sampling

Bore ID: MW91

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**F. Manca and M. Prskalo**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.726	**SWL (m bTOC)**	9.985	**Purge method**	Low flow
Screen interval (m bgl)	12.1-18.1	**Date & Time**	15/08/2023	**Water level method**	Interface Meter
Total bore depth (m bgl)	18.86 m BTOC	**Min. purge volume (L)**	NA	**Sample method**	Low Flow
Casing internal diameter (mm)	50	**Bore condition**	New	**QA sample collected? ID**	No

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
15/08/2023 14:06	5	68.4	6.3	3490			6.91	107.6	24.7	SWL 9.973 clear no odour
15/08/2023 14:10	7	76.7	5.67	3490			6.91	106.7	24.7	SWL 9.973 clear no odour
15/08/2023 14:12	9	69.8	5.92	3510			6.91	106.2	24.7	SWL 9.973 clear no odour
15/08/2023 14:14	10	79.6	5.89	3509			6.90	105.7	24.7	SWL 9.975 clear no odour
15/08/2023 14:16	12	71.6	6.05	3514			6.89	105.2	24.8	SWL 9.978 clear no odour
15/08/2023 14:17	13	61.6	5.69	3528			6.89	104.6	24.8	SWL 9.983 clear no odour
15/08/2023 14:19	14	67	5.09	3525			6.88	104	24.8	SWL 9.984 clear no odour
15/08/2023 14:21	16	69.3	6.24	3548			6.88	103.4	24.6	SWL 9.985 clear no odour
										Sample collected 15/08/2023 at 14:25

Groundwater purging and sampling

Bore ID: MW94

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**F. Manca and M. Prskalo**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.505	**SWL (m bTOC)**	9.614	**Purge method**	Bailer
Screen interval (m bgl)	19-25m	**Date & Time**	15/08/2023	**Water level method**	Interface Meter
Total bore depth (m bgl)	25	**Min. purge volume (L)**	94 (3 x casing volumes)	**Sample method**	Bailer
Casing internal diameter (mm)	50	**Bore condition**	New	**QA sample collected? ID**	No

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
15/08/2023 7:25	10	54.6		11431			7.33	113.2	22.7	Clear no odour
15/08/2023 7:30	20	25.5	2.11	11431			7.15	110.5	23.2	Clear no odour
15/08/2023 7:40	30	20.5	1.69	11427			7.40	107.5	23.2	Clear no odour
15/08/2023 7:50	40	13	1.07	11436			7.08	106.6	23.2	Clear no odour
15/08/2023 7:54	50	15.4	1.39	11428			7.08	105.8	23.3	Clear no odour
15/08/2023 7:58	60	18.3	1.5	11434			7.09	105.3	23.5	Clear no odour
15/08/2023 8:03	70	14.2	1.15	11426			7.08	104.7	23.5	Clear no odour
15/08/2023 8:08	80	12.5	1.02	11439			7.08	103.9	23.6	Clear no odour
15/08/2023 8:15	90	15.8	1.29	11437			7.09	103.6	23.6	Clear no odour
15/08/2023 8:15	95	10.3	0.84	11432			7.07	102.5	23.5	Clear no odour
										Sampled via bailer 15/08/2023 at 08:28

Groundwater purging and sampling

Bore ID: MW98

Project:	**Callide Groundwater Bore Drilling Project**			**Project number:**	**12609270**
Client:	**CS Energy**	**Site:**	**Callide B Power Station**	**Sampler:**	**F. Manca and M. Prskalo**

Bore details:		**Pre-purging details:**		**Purging details:**	
Total casing stickup (m agl)	0.58	**SWL (m bTOC)**	9.47	**Purge method**	Bailer
Screen interval (m bgl)	12-18m	**Date & Time**	14/08/2023	**Water level method**	Interface Meter
Total bore depth (m bgl)	18.455 m BTOC	**Min. purge volume (L)**	53 (3 x casing volumes)	**Sample method**	Bailer
Casing internal diameter (mm)	50	**Bore condition**	New	**QA sample collected? ID**	No

Bore purging water quality observations

Date / Time	Vol. removed L	DO %S	DO ppm	SPC @ 25° uS/cm	EC uS/cm	TDS ppm	pH	Redox mV	Temp C	Comments (colour, turbidity, sediment load, odour, other)
14/08/2023 13:33	10	27.7	2.26	8124			7.49	89	23.9	
14/08/2023 13:40	20	23.3	1.93	8158			7.57	58.4	23.4	Brown tinge, < 1 tsp sediment, no odour
14/08/2023 13:50	30	36	3	8130			7.66	54.8	23.0	Brown-purple, high suspended sediment content, no odour
14/08/2023 13:59	40	37.4	32.9	8116			7.46	51.4	23.7	Brown-purple, high suspended sediment content, no odour
14/08/2023 14:05	3									Bore bailed dry @14:05
										Left overnight to recover
15/08/2023 6:49										SWL 15/08/2023 @ 6:49, 12.056 mbTOc
15/08/2023 7:05		39.7	3.44	8096			7.43	104.6	20.5	Sampled by bailer 15/08/2023 at 07:05

Appendix C

Groundwater results summary tables

Table A1: Groundwater samples analysis results

Table A2: Duplicate samples RPD results

Table A3: Rinsate, Field Blanks, and Transport Blank Sample Results

	Field	Field Parameters					NA	Inorganics				Acidity & Alkalinity							
	DO (%S)	pH (Field)	Dissolved Oxygen (Field) (filtered)	Redox (Field)	Temperature (Field)	Specific Conductivity (Field)	Phosphorus reactive (as P)	pH (Lab)	Electrical conductivity (lab)	Total Dissolved Solids (est.)	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Hardness as CaCO3 (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)
	DO %S	pH units	mg/L	MILLIVOLTS	°C	µS/cm	MG/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL							0.01	0.01	1	1	5	1	1	1	1	1	1	1	1
ADWG 2011 Aesthetic (v3.7 updated 2022)		**6.5-8.5**						**6.5-8.5**								**200**			
ADWG 2011 Health (v3.7 updated 2022)																			
ADWG 2011 Recreational (v3.7 updated 2022)																			
ANZG (2018) - FW - 99% (updated 26 July 2021)																			
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems																			
PFAS NEMP 2.0 2020 Health Drinking Water																			
PFAS NEMP 2.0 2020 Recreational Water																			

Location Code	Date	Field ID	Monitoring Zone																	
MW78	15 Aug 2023	MW78_GW	On site	2.11	7.03	25.2	105.6	25	11,408	0.01	8.17	11,600	7,540	19	<1	577	<1	577	**1,540**	115	304	2
MW81	04 Aug 2023	MW81_PT_01	On site	-	6.79	2.23	-273.5	23.2	7,021	<0.01	7.56	6,600	4,290	<5	<1	432	<1	432	**3,330**	290	632	<1
		MW81_PT_02	On site	-	6.76	2.81	-517.8	25.1	7,062	<0.01	7.44	6,640	4,320	<5	<1	432	<1	432	**3,230**	284	613	<1
MW82	07 Aug 2023	MW82_PT_01	On site	-	7.32	0.5	73	24.1	10,237	<0.01	7.69	10,500	6,820	<5	<1	175	<1	175	**3,530**	513	547	3
		MW82_PT_02	On site	-	7.29	0.58	-501.9	24.2	10,099	<0.01	7.93	10,200	6,630	<5	<1	182	<1	182	**3,570**	503	563	2
MW83	02 Aug 2023	MW83_PT_01	On site	-	6.9	2.15	-144.3	22.9	8,145	<0.01	7.25	8,400	5,460	32	<1	341	<1	341	**2,800**	347	469	<1
MW84	14 Aug 2023	MW84_GW	On site	14.8	6.73	1.18	48.8	25.9	5,836	0.01	7.33	5,560	3,610	<5	<1	552	<1	552	**2,500**	257	452	<1
MW85	14 Aug 2023	MW85_GW	On site	-	**11.59**	2.56	45.2	24.5	9,786	<0.05	**12.0**	10,400	6,760	10	38	<1	987	1,020	**2,700**	1,080	<1	40
MW89	15 Aug 2023	MW89_GW	Off site	22.5	6.8	1.85	96.6	23.5	7,928	0.01	7.30	7,620	4,950	456	<1	400	<1	400	**3,060**	308	557	<1
MW90	10 Aug 2023	MW90_PT_01	Off site	-	6.74	2.19	97.4	24.1	8,602	<0.01	7.94	9,430	6,130	<5	<1	365	<1	365	**3,250**	327	592	<1
		MW90_PT_02	Off site	-	6.76	2.32	92.9	23.8	8,570	<0.01	7.90	9,120	5,930	<5	<1	350	<1	350	**3,340**	333	610	<1
MW91	15 Aug 2023	MW91_GW	Off site	69.3	6.88	6.24	103.4	24.6	3,548	<0.01	7.49	3,430	2,230	14	<1	669	<1	669	**1,200**	131	213	<1
MW94	15 Aug 2023	MW94_GW	On site	10.3	7.07	0.84	102.5	23.5	11,437	0.02	7.65	11,300	7,340	<5	<1	631	<1	631	**1,540**	114	304	2
MW98	15 Aug 2023	MW98_GW	On site	39.7	7.43	3.44	104.6	20.5	8,096	0.01	7.93	7,700	5,000	654	<1	982	<1	982	**431**	29	87	3
Tank 01	28 Jul 2023	TANK_01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistics

Number of Results	6	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Number of Detects	6	14	14	14	14	14	5	14	14	14	6	1	13	1	14	14	14	13	6
Minimum Concentration	2.11	6.73	0.5	-517.8	20.5	3,548	0.01	7.25	3,430	2,230	<5	<1	<1	<1	175	431	29	<1	<1
Minimum Detect	2.11	6.73	0.5	-517.8	20.5	3,548	0.01	7.25	3,430	2,230	10	38	175	987	175	431	29	87	2
Maximum Concentration	69.3	11.59	25.2	105.6	25.9	11,437	<0.05	12	11,600	7,540	654	38	982	987	1,020	3,570	1,080	632	40
Maximum Detect	69.3	11.59	25.2	105.6	25.9	11,437	0.02	12	11,600	7,540	654	38	982	987	1,020	3,570	1,080	632	40

* A Non Detect Multiplier of 0.5 has been applied.

Comments

#1 Not specifically guideline value: >500mg/L can have purgative effects.
#2 Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#3 Indicative purposes only.
#4 Guideline value calculated by dividing Nitrite (as Nitrite) value (30 mg/L) by molecular weight (3.2967033).
#5 Measured as NH3-N at pH 8.
#6 For indicative purposes only.

Environmental Standards
National Health and Medical Research Council (NHMRC), January 2022, ADWG 2011 Aesthetic (v3.7 updated 2022)
NHMRC, January 2022, ADWG 2011 Health (v3.7 updated 2022)
NHMRC, January 2022, ADWG 2011 Recreational (v3.7 updated 2022)
Department of Agriculture and Water Resources, 2018 updated July 2021, ANZG (2018) - FW - 99% (updated 26 July 2021)
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Health Drinking Water
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Recreational Water

	Major Ions							Nutrients			Metals				Organic Fluorine	PFAS - Perfluoroalkyl Sulfonic A			
	Sodium (filtered)	Chloride	Sulfate (filtered)	Fluoride	Cations Total	Anions Total	Ionic Balance	Ammonia as N	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Total Organic Fluorine	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)
	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	1	1	1	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.05	0.001	0.001	20	0.0005	0.0005	0.0005	0.0005
ADWG 2011 Aesthetic (v3.7 updated 2022)	**180**	**250**	**250**								**0.3**	**0.3**	**0.1**	**0.1**					
ADWG 2011 Health (v3.7 updated 2022)			**500[#1]**	**1.5**					**0.91[#2]**				**0.5**	**0.5**					
ADWG 2011 Recreational (v3.7 updated 2022)			**5,000[#1]**	**15**					**9.1[#4]**				**5**	**5**					
ANZG (2018) - FW - 99% (updated 26 July 2021)								**0.32[#5]**					**1.2**	**1.2**					
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems																			
PFAS NEMP 2.0 2020 Health Drinking Water																		**0.07**	
PFAS NEMP 2.0 2020 Recreational Water																		**2**	
Location Code	**Date**	**Field ID**	**Monitoring Zone**																
MW78	15 Aug 2023	MW78_GW	On site	**2,110**	**2,790**	**1,560**	1.2	122	123	0.05	0.06	<0.01	<0.01	**0.56**	<0.05	0.06	0.052	<20	0.0212	0.0059	0.0348	0.0011
MW81	04 Aug 2023	MW81_PT_01	On site	**458**	**1,620**	**1,270**	0.5	86.4	80.8	3.37	0.03	<0.01	<0.01	<0.05	<0.05	0.013	0.013	<20	0.0169	0.0110	**0.0881**	0.0037
		MW81_PT_02	On site	**423**	**1,650**	**1,300**	0.4	83.0	82.2	0.47	0.02	<0.01	<0.01	<0.05	<0.05	0.011	0.011	<20	0.0329	0.0264	**0.225**	0.0083
MW82	07 Aug 2023	MW82_PT_01	On site	**1,060**	**2,640**	**2,030**	**1.6**	117	120	1.45	0.24	<0.01	<0.01	<0.05	<0.05	**8.40**	**8.05**	<20	0.0141	0.0066	0.0368	<0.0010
		MW82_PT_02	On site	**1,080**	**3,050**	**1,980**	1.4	118	131	4.98	0.18	<0.01	<0.01	<0.05	<0.05	**6.85**	**7.50**	<20	0.0139	0.0069	0.0396	<0.0010
MW83	02 Aug 2023	MW83_PT_01	On site	**949**	**1,940**	**1,300**	0.8	97.2	88.6	4.62	0.07	<0.01	<0.01	**0.72**	<0.05	**1.12**	**1.30**	<20	0.0131	0.0087	0.0555	0.0025
MW84	14 Aug 2023	MW84_GW	On site	**315**	**1,320**	**763**	0.5	63.7	64.2	0.33	0.04	<0.01	<0.01	**0.32**	<0.05	<0.01	0.010	30	2.03	2.62	**16.5**	0.803
MW85	14 Aug 2023	MW85_GW	On site	**726**	**1,600**	**574**	0.7	86.5	77.5	5.51	**0.32**	0.01	<0.01	0.27	<0.05	<0.01	<0.001	<20	0.0547	0.0531	**0.343**	0.0121
MW89	15 Aug 2023	MW89_GW	Off site	**583**	**1,840**	**1,310**	0.5	86.6	87.2	0.34	0.05	0.01	0.28	**1.39**	<0.05	0.07	0.023	<20	0.0282	0.0188	**0.181**	0.0069
MW90	10 Aug 2023	MW90_PT_01	Off site	**827**	**1,990**	**1,420**	0.5	101	93.0	4.13	0.02	<0.01	<0.01	<0.05	<0.05	<0.01	0.022	<20	0.0220	0.0128	**0.118**	0.0045
		MW90_PT_02	Off site	**808**	**1,940**	**1,430**	0.5	102	91.5	5.42	0.02	<0.01	<0.01	<0.05	<0.05	<0.01	0.028	<20	0.0238	0.0135	**0.118**	0.0046
MW91	15 Aug 2023	MW91_GW	Off site	**311**	**719**	233	0.6	37.6	38.5	1.19	0.04	<0.01	0.01	0.11	<0.05	<0.01	0.008	<20	0.113	0.146	**0.825**	0.0230
MW94	15 Aug 2023	MW94_GW	On site	**2,070**	**2,780**	**1,570**	1.0	121	124	1.19	0.02	0.01	<0.01	<0.05	<0.05	0.04	0.051	<20	0.0186	0.0060	0.0338	0.0013
MW98	15 Aug 2023	MW98_GW	On site	**1,590**	**2,000**	89	**2.3**	77.8	77.9	0.03	0.02	0.01	0.49	**0.56**	<0.05	**0.14**	**0.121**	<20	<0.0095	0.0054	0.0591	0.0015
Tank 01	28 Jul 2023	TANK_01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.189	0.226	**1.27**	0.0661
Statistics																						
Number of Results	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	15	15	15	15
Number of Detects	14	14	14	14	14	14	14	14	4	3	7	0	9	13	1	14	15	15	13
Minimum Concentration	311	719	89	0.4	37.6	38.5	0.03	0.02	0.01	0.01	<0.05	<0.05	<0.01	<0.001	<20	<0.0095	0.0054	0.0338	<0.001
Minimum Detect	311	719	89	0.4	37.6	38.5	0.03	0.02	0.01	0.01	0.11	ND	0.011	0.008	30	0.0131	0.0054	0.0338	0.0011
Maximum Concentration	2,110	3,050	2,030	2.3	122	131	5.51	0.32	0.01	0.49	1.39	<0.05	8.4	8.05	30	2.03	2.62	16.5	0.803
Maximum Detect	2,110	3,050	2,030	2.3	122	131	5.51	0.32	0.01	0.49	1.39	ND	8.4	8.05	30	2.03	2.62	16.5	0.803

* A Non Detect Multiplier of 0.5 has been applied.

Comments

#1 Not specifically guideline value: >500mg/L can have purgative effects.
#2 Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#3 Indicative purposes only.
#4 Guideline value calculated by dividing Nitrite (as Nitrite) value (30 mg/L) by molecular weight (3.2967033).
#5 Measured as NH3-N at pH 8.
#6 For indicative purposes only.

Environmental Standards
National Health and Medical Research Council (NHMRC), January 2022, ADWG 2011 Aesthetic (v3.7 updated 2022)
NHMRC, January 2022, ADWG 2011 Health (v3.7 updated 2022)
NHMRC, January 2022, ADWG 2011 Recreational (v3.7 updated 2022)
Department of Agriculture and Water Resources, 2018 updated July 2021, ANZG (2018) - FW - 99% (updated 26 July 2021)
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Health Drinking Water
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Recreational Water

				PFAS - Perfluoroalkyl Carboxylic Acids												PFAS - Perfluoroalkyl Sulfonamide					
				Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.0002	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.001	0.0005	0.001	0.001
ADWG 2011 Aesthetic (v3.7 updated 2022)																						
ADWG 2011 Health (v3.7 updated 2022)										**0.56**												
ADWG 2011 Recreational (v3.7 updated 2022)										**5.6**												
ANZG (2018) - FW - 99% (updated 26 July 2021)																						
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems				**0.13**						**220**												
PFAS NEMP 2.0 2020 Health Drinking Water				**0.07**						**0.56**												
PFAS NEMP 2.0 2020 Recreational Water				**2**						**10**												
Location Code	**Date**	**Field ID**	**Monitoring Zone**																			
MW78	15 Aug 2023	MW78_GW	On site	0.0229	<0.0005	<0.0079	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001
MW81	04 Aug 2023	MW81_PT_01	On site	0.0459	<0.0005	<0.0077	<0.0015	<0.0015	<0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001
		MW81_PT_02	On site	**0.0828**	<0.0005	<0.0077	<0.0015	<0.0052	<0.0015	0.0023	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0039	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001
MW82	07 Aug 2023	MW82_PT_01	On site	0.0232	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.0016	<0.004	<0.004
		MW82_PT_02	On site	0.0223	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0016	<0.0041	<0.0016	<0.004	<0.004	<0.0016	<0.004	<0.004
MW83	02 Aug 2023	MW83_PT_01	On site	0.0645	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001
MW84	14 Aug 2023	MW84_GW	On site	**9.62**	<0.0317	0.644	1.08	4.89	0.590	**1.02**	<0.0317	<0.0317	<0.0317	<0.0317	<0.0317	<0.0794	<0.0317	<0.079	<0.079	<0.0317	<0.079	<0.079
MW85	14 Aug 2023	MW85_GW	On site	**0.119**	<0.0016	0.0309	<0.0030	0.0022	<0.0016	0.0084	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.0016	<0.004	<0.004
MW89	15 Aug 2023	MW89_GW	Off site	0.0666	<0.0005	0.0142	0.0028	0.0121	0.0015	0.0042	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001
MW90	10 Aug 2023	MW90_PT_01	Off site	0.0667	<0.0005	<0.0079	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001
		MW90_PT_02	Off site	0.0684	<0.0005	<0.0078	<0.0016	<0.0016	<0.0005	<0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001
MW91	15 Aug 2023	MW91_GW	Off site	**0.0914**	<0.0016	0.0777	0.0464	0.110	0.0189	0.0265	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0040	<0.0016	<0.004	<0.004	<0.0016	<0.004	<0.004
MW94	15 Aug 2023	MW94_GW	On site	0.0265	<0.0005	<0.0079	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001
MW98	15 Aug 2023	MW98_GW	On site	0.0400	<0.0005	<0.0080	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001
Tank 01	28 Jul 2023	TANK_01		**0.168**	<0.0005	0.135	0.0596	0.201	0.0358	0.0650	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001

Statistics

Number of Results	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Number of Detects	15	0	5	4	5	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	0.0223	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001	<0.001
Minimum Detect	0.0223	ND	0.0142	0.0028	0.0022	0.0015	0.0023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	9.62	<0.0317	0.644	1.08	4.89	0.59	1.02	<0.0317	<0.0317	<0.0317	<0.0317	<0.0317	<0.0794	<0.0317	<0.079	<0.079	<0.0317	<0.079	<0.079
Maximum Detect	9.62	ND	0.644	1.08	4.89	0.59	1.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

Comments

#1 Not specifically guideline value: >500mg/L can have purgative effects.
#2 Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
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#4 Guideline value calculated by dividing Nitrite (as Nitrite) value (30 mg/L) by molecular weight (3.2967033).
#5 Measured as NH3-N at pH 8.
#6 For indicative purposes only.

Environmental Standards
National Health and Medical Research Council (NHMRC), January 2022, ADWG 2011 Aesthetic (v3.7 updated 2022)
NHMRC, January 2022, ADWG 2011 Health (v3.7 updated 2022)
NHMRC, January 2022, ADWG 2011 Recreational (v3.7 updated 2022)
Department of Agriculture and Water Resources, 2018 updated July 2021, ANZG (2018) - FW - 99% (updated 26 July 2021)
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Health Drinking Water
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Recreational Water

		PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums			PFAS TOPA - Perfluoroalkyl Carboxylic Acids										
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	PFBA (TOPA)	PFPeA (TOPA)	PFHxA (TOPA)	PFHpA (TOPA)	PFOA (TOPA)	PFNA (TOPA)	PFDA (TOPA)	PFUnDA (TOPA)	PFDoDA (TOPA)	PFTrDA (TOPA)	PFTeDA (TOPA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.0005	0.001	0.001	0.001	0.001	0.0002	0.0002	0.0002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005
ADWG 2011 Aesthetic (v3.7 updated 2022)																			
ADWG 2011 Health (v3.7 updated 2022)						**0.07**							**0.56**[#3]						
ADWG 2011 Recreational (v3.7 updated 2022)						**0.7**													
ANZG (2018) - FW - 99% (updated 26 July 2021)																			
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems													**220**[#3]						
PFAS NEMP 2.0 2020 Health Drinking Water						**0.07**							**0.56**[#6]						
PFAS NEMP 2.0 2020 Recreational Water						**2**							**10**[#6]						

Location Code	Date	Field ID	Monitoring Zone																	
MW78	15 Aug 2023	MW78_GW	On site	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0577	0.0859	0.0789	<0.01	<0.002	0.015	<0.002	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
MW81	04 Aug 2023	MW81_PT_01	On site	<0.0005	<0.002	<0.001	<0.001	<0.001	**0.134**	0.166	0.151	<0.01	<0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
		MW81_PT_02	On site	<0.0005	<0.002	<0.001	<0.001	<0.001	**0.308**	0.378	0.343	0.01	0.005	0.017	<0.002	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
MW82	07 Aug 2023	MW82_PT_01	On site	<0.0016	<0.002	<0.001	<0.001	<0.002	0.0600	0.0807	0.0741	0.01	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
		MW82_PT_02	On site	<0.0016	<0.002	<0.001	<0.001	<0.002	0.0619	0.0827	0.0758	0.01	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
MW83	02 Aug 2023	MW83_PT_01	On site	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.120**	0.144	0.133	<0.01	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
MW84	14 Aug 2023	MW84_GW	On site	<0.0317	<0.032	<0.032	<0.032	<0.032	**26.1**	39.8	36.4	1.12	1.61	7.03	0.605	**1.10**	<0.049	<0.049	<0.049	<0.049	<0.049	<0.122
MW85	14 Aug 2023	MW85_GW	On site	<0.0016	<0.002	<0.016	<0.002	<0.002	**0.462**	0.623	0.558	0.03	0.004	0.012	<0.002	0.010	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
MW89	15 Aug 2023	MW89_GW	Off site	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.248**	0.336	0.311	0.02	0.007	0.020	0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
MW90	10 Aug 2023	MW90_PT_01	Off site	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.185**	0.224	0.207	<0.01	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
		MW90_PT_02	Off site	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.186**	0.228	0.210	<0.01	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
MW91	15 Aug 2023	MW91_GW	Off site	<0.0016	<0.002	<0.002	<0.002	<0.002	**0.916**	1.48	1.31	0.08	0.045	0.118	0.018	0.026	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
MW94	15 Aug 2023	MW94_GW	On site	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0603	0.0862	0.0789	<0.01	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
MW98	15 Aug 2023	MW98_GW	On site	<0.0005	<0.001	<0.001	<0.001	<0.001	**0.0991**	0.106	0.0991	<0.01	<0.002	0.010	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
Tank 01	28 Jul 2023	TANK_01		<0.0005	<0.001	<0.001	<0.001	<0.001	**1.44**	2.42	2.12	0.13	0.063	0.204	0.029	0.046	<0.010	<0.010	<0.010	<0.010	<0.010	<0.025

Statistics

Number of Results	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Number of Detects	0	0	0	0	0	15	15	15	8	6	15	4	7	0	0	0	0	0	0
Minimum Concentration	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0577	0.0807	0.0741	0.01	<0.002	0.005	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
Minimum Detect	ND	ND	ND	ND	ND	0.0577	0.0807	0.0741	0.01	0.004	0.005	0.002	0.004	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.0317	<0.032	<0.032	<0.032	<0.032	26.1	39.8	36.4	1.12	1.61	7.03	0.605	1.1	<0.049	<0.049	<0.049	<0.049	<0.049	<0.122
Maximum Detect	ND	ND	ND	ND	ND	26.1	39.8	36.4	1.12	1.61	7.03	0.605	1.1	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

Comments

#1 Not specifically guideline value: >500mg/L can have purgative effects.
#2 Guideline value calculated by dividing Nitrite (as Nitrite) value (0.3 mg/L) by molecular weight (3.2967033).
#3 Indicative purposes only.
#4 Guideline value calculated by dividing Nitrite (as Nitrite) value (30 mg/L) by molecular weight (3.2967033).
#5 Measured as NH3-N at pH 8.
#6 For indicative purposes only.

Environmental Standards
National Health and Medical Research Council (NHMRC), January 2022, ADWG 2011 Aesthetic (v3.7 updated 2022)
NHMRC, January 2022, ADWG 2011 Health (v3.7 updated 2022)
NHMRC, January 2022, ADWG 2011 Recreational (v3.7 updated 2022)
Department of Agriculture and Water Resources, 2018 updated July 2021, ANZG (2018) - FW - 99% (updated 26 July 2021)
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Health Drinking Water
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Recreational Water

				PFAS TOPA - Perfluoroalkyl Sulfonic Acids						PFAS TOPA - Perfluoroalkyl Sulfonamide							PFAS TOPA - Fluorotelomer Sulfonic Acids				PFAS TOI	
				PFBS (TOPA)	PFPeS (TOPA)	PFHxS (TOPA)	PFHpS (TOPA)	PFOS (TOPA)	PFDS (TOPA)	FOSA (TOPA)	MeFOSA (TOPA)	EtFOSA (TOPA)	MeFOSAA (TOPA)	MeFOSE (TOPA)	EtFOSE (TOPA)	EtFOSAA (TOPA)	4:2 FTS (TOPA)	6:2 FTS (TOPA)	8:2 FTS (TOPA)	10:2 FTS (TOPA)	Sum of PFHxS and PFOS (TOPA)	Sum of PFAS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.002	0.005	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002
ADWG 2011 Aesthetic (v3.7 updated 2022)																						
ADWG 2011 Health (v3.7 updated 2022)																					**0.07**[#3]	
ADWG 2011 Recreational (v3.7 updated 2022)																						
ANZG (2018) - FW - 99% (updated 26 July 2021)																						
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems								**0.13**[#3]														
PFAS NEMP 2.0 2020 Health Drinking Water						**0.07**[#6]		**0.07**[#6]													**0.07**[#6]	
PFAS NEMP 2.0 2020 Recreational Water						**2**[#6]		**2**[#6]													**2**[#6]	
Location Code	**Date**	**Field ID**	**Monitoring Zone**																			
MW78	15 Aug 2023	MW78_GW	On site	0.018	0.014	**0.095**	0.006	**0.104**	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	**0.199**	0.256
MW81	04 Aug 2023	MW81_PT_01	On site	0.013	0.012	**0.073**	0.003	0.053	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	**0.126**	0.161
		MW81_PT_02	On site	0.029	0.032	**0.200**	0.007	**0.102**	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	**0.302**	0.406
MW82	07 Aug 2023	MW82_PT_01	On site	0.013	0.008	0.033	<0.002	0.019	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	0.052	0.089
		MW82_PT_02	On site	0.012	0.007	0.031	<0.002	0.019	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	0.050	0.085
MW83	02 Aug 2023	MW83_PT_01	On site	0.014	0.010	0.057	<0.002	0.058	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	**0.115**	0.145
MW84	14 Aug 2023	MW84_GW	On site	2.02	2.33	**15.2**	0.800	**8.35**	<0.049	<0.049	<0.122	<0.122	<0.049	<0.122	<0.122	<0.049	<0.049	<0.049	<0.049	<0.049	**23.6**	40.2
MW85	14 Aug 2023	MW85_GW	On site	0.052	0.056	**0.333**	0.012	**0.109**	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	**0.442**	0.618
MW89	15 Aug 2023	MW89_GW	Off site	0.029	0.029	**0.182**	0.007	0.055	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	**0.237**	0.356
MW90	10 Aug 2023	MW90_PT_01	Off site	0.020	0.017	**0.107**	0.005	0.067	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	**0.174**	0.221
		MW90_PT_02	Off site	0.020	0.018	**0.106**	0.004	0.063	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	**0.169**	0.216
MW91	15 Aug 2023	MW91_GW	Off site	0.131	0.148	**0.776**	0.022	0.053	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	**0.829**	1.42
MW94	15 Aug 2023	MW94_GW	On site	0.015	0.008	0.037	<0.002	0.023	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	0.060	0.088
MW98	15 Aug 2023	MW98_GW	On site	0.004	0.006	0.067	<0.002	0.027	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	**0.094**	0.114
Tank 01	28 Jul 2023	TANK_01		0.164	0.191	**1.09**	0.027	<0.140	<0.010	<0.010	<0.025	<0.025	<0.010	<0.025	<0.025	<0.010	<0.010	<0.010	<0.010	<0.010	**1.09**	1.94
Statistics																						
Number of Results				15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Number of Detects				15	15	15	10	14	0	0	0	0	0	0	0	0	0	0	0	0	15	15
Minimum Concentration				0.004	0.006	0.031	<0.002	0.019	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	0.05	0.085
Minimum Detect				0.004	0.006	0.031	0.003	0.019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.085
Maximum Concentration				2.02	2.33	15.2	0.8	8.35	<0.049	<0.049	<0.122	<0.122	<0.049	<0.122	<0.122	<0.049	<0.049	<0.049	<0.049	<0.049	23.6	40.2
Maximum Detect				2.02	2.33	15.2	0.8	8.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23.6	40.2

* A Non Detect Multiplier of 0.5 has been applied.

Comments

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NHMRC, January 2022, ADWG 2011 Health (v3.7 updated 2022)
NHMRC, January 2022, ADWG 2011 Recreational (v3.7 updated 2022)
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HEPA, Jan 2020, PFAS NEMP 2.0 2020 Recreational Water

				PA - Sums	
				Sum of TOP C4 - C14 as Fluorine	Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfo_
				µg/L	µg/L
EQL				0.002	0.002
ADWG 2011 Aesthetic (v3.7 updated 2022)					
ADWG 2011 Health (v3.7 updated 2022)					
ADWG 2011 Recreational (v3.7 updated 2022)					
ANZG (2018) - FW - 99% (updated 26 July 2021)					
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems					
PFAS NEMP 2.0 2020 Health Drinking Water					
PFAS NEMP 2.0 2020 Recreational Water					
Location Code	**Date**	**Field ID**	**Monitoring Zone**		
MW78	15 Aug 2023	MW78_GW	On site	0.161	0.256
MW81	04 Aug 2023	MW81_PT_01	On site	0.100	0.161
		MW81_PT_02	On site	0.253	0.406
MW82	07 Aug 2023	MW82_PT_01	On site	0.055	0.089
		MW82_PT_02	On site	0.053	0.085
MW83	02 Aug 2023	MW83_PT_01	On site	0.090	0.145
MW84	14 Aug 2023	MW84_GW	On site	25.4	40.2
MW85	14 Aug 2023	MW85_GW	On site	0.383	0.618
MW89	15 Aug 2023	MW89_GW	Off site	0.221	0.356
MW90	10 Aug 2023	MW90_PT_01	Off site	0.137	0.221
		MW90_PT_02	Off site	0.134	0.216
MW91	15 Aug 2023	MW91_GW	Off site	0.878	1.42
MW94	15 Aug 2023	MW94_GW	On site	0.054	0.088
MW98	15 Aug 2023	MW98_GW	On site	0.071	0.114
Tank 01	28 Jul 2023	TANK_01		1.20	1.94

Statistics

Number of Results	15	15
Number of Detects	15	15
Minimum Concentration	0.053	0.085
Minimum Detect	0.053	0.085
Maximum Concentration	25.4	40.2
Maximum Detect	25.4	40.2

* A Non Detect Multiplier of 0.5 has been applied.

Comments

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Department of Agriculture and Water Resources, 2018 updated July 2021, ANZG (2018) - FW - 99% (updated 26 July 2021)
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HEPA, Jan 2020, PFAS NEMP 2.0 2020 Health Drinking Water
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Recreational Water

						NA		Inorganics				Acidity & Alkalinity											
						Adsorbable Organofluorine (AOF)*	Phosphorus reactive (as P)	pH (Lab)	Electrical conductivity (lab)	Total Dissolved Solids (est.)	Total Suspended Solids	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (total as CaCO3)	Hardness as CaCO3	Hardness as CaCO3 (filtered)	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)
						MG F/L	MG/L	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL						0.05	0.01	0.01	1	1	5	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**																		
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	-	<0.01	7.69	10,500	6,820	<5	<1	175	<1	175	-	3,530	-	513	-	547	-	3
		FD01_GW	Water	Field_D	EB2324549	-	<0.01	7.72	10,200	6,630	<5	<1	176	<1	176	-	3,530	-	519	-	542	-	3
RPD						-	0	0	3	3	0	0	1	0	1	-	0	-	1	-	1	-	0
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	-	<0.01	7.69	10,500	6,820	<5	<1	175	<1	175	-	3,530	-	513	-	547	-	3
		FS01_GW	Water	Interlab_D	1016189	<0.05	0.02	7.3	9,000	-	12	<20	220	<20	220	4,200	-	660	-	630	-	3.1	-
RPD						-	67	5	15	-	82	0	23	0	23	-	-	-	-	-	-	-	-
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	-	<0.01	7.69	10,500	6,820	<5	<1	175	<1	175	-	3,530	-	513	-	547	-	3
		FS01_GW	Water	Interlab_D	1016189	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	-	0.01	7.33	5,560	3,610	<5	<1	552	<1	552	-	2,500	-	257	-	452	-	<1
		FD02_GW	Water	Field_D	EB2325216	-	<0.01	7.97	6,150	4,000	<5	<1	507	<1	507	-	2,550	-	264	-	459	-	<1
RPD						-	0	8	10	10	0	0	8	0	8	-	2	-	3	-	2	-	0
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	-	0.01	7.33	5,560	3,610	<5	<1	552	<1	552	-	2,500	-	257	-	452	-	<1
		FS02_GW	Water	Interlab_D	1018509	<0.05	0.02	7.6	5,600	-	12	<20	620	<20	620	3,000	-	310	-	540	-	<0.5	-
RPD						-	67	4	1	-	82	0	12	0	12	-	-	-	-	-	-	-	-
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	-	0.01	7.33	5,560	3,610	<5	<1	552	<1	552	-	2,500	-	257	-	452	-	<1
		FS02_GW	Water	Interlab_D	1018509	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

						Major Ions									Nutrients				Metals				Organic Fluorine
						Sodium	Sodium (filtered)	Chloride	Sulfate	Sulfate (filtered)	Fluoride	Cations Total	Anions Total	Ionic Balance	Ammonia as N	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total Oxidised) (as N)	Iron	Iron (filtered)	Manganese	Manganese (filtered)	Total Organic Fluorine
						mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L
EQL						0.5	0.5	1	1	1	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.05	0.001	0.001	20
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**																		
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	-	1,060	2,640	-	2,030	1.6	117	120	1.45	0.24	<0.01	<0.01	<0.01	<0.05	<0.05	8.40	8.05	<20
		FD01_GW	Water	Field_D	EB2324549	-	1,080	2,730	-	2,030	1.6	118	123	2.18	0.20	<0.01	<0.01	<0.01	<0.05	<0.05	8.12	8.40	<20
RPD						-	2	3	-	0	0	1	2	40	18	0	0	0	0	0	3	4	0
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	-	1,060	2,640	-	2,030	1.6	117	120	1.45	0.24	<0.01	<0.01	<0.01	<0.05	<0.05	8.40	8.05	<20
		FS01_GW	Water	Interlab_D	1016189	1,200	-	2,500	2,300	-	<0.5	-	-	-	0.06	0.04	<0.02	<0.05	<0.05	<0.05	9.9	9.0	-
RPD						-	-	5	-	-	105	-	-	-	120	120	0	0	0	0	16	11	-
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	-	1,060	2,640	-	2,030	1.6	117	120	1.45	0.24	<0.01	<0.01	<0.01	<0.05	<0.05	8.40	8.05	<20
		FS01_GW	Water	Interlab_D	1016189	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	-	315	1,320	-	763	0.5	63.7	64.2	0.33	0.04	<0.01	<0.01	<0.01	0.32	<0.05	<0.01	0.010	30
		FD02_GW	Water	Field_D	EB2325216	-	323	1,380	-	772	0.6	65.0	65.1	0.10	0.03	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	0.010	30
RPD						-	3	4	-	1	18	2	1	107	29	0	0	0	146	0	0	0	0
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	-	315	1,320	-	763	0.5	63.7	64.2	0.33	0.04	<0.01	<0.01	<0.01	0.32	<0.05	<0.01	0.010	30
		FS02_GW	Water	Interlab_D	1018509	370	-	1,400	700	-	-	-	-	-	<0.01	<0.02	<0.02	<0.05	0.07	<0.05	0.012	0.009	-
RPD						-	-	6	-	-	-	-	-	-	120	0	0	0	128	0	18	11	-
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	-	315	1,320	-	763	0.5	63.7	64.2	0.33	0.04	<0.01	<0.01	<0.01	0.32	<0.05	<0.01	0.010	30
		FS02_GW	Water	Interlab_D	1018509	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

						PFAS - Perfluoroalkyl Sulfonic Acids							PFAS - Perfluoroalkyl Carboxylic Acids										
						Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.001	0.0005	0.0005	0.0005	0.0005	0.0001	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**																		
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	-	0.0141	0.0066	0.0368	<0.0010	0.0232	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0016	<0.0040
		FD01_GW	Water	Field_D	EB2324549	-	0.0135	0.0072	0.0376	<0.0010	0.0214	<0.0016	<0.0080	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0016	<0.0040
RPD						-	4	9	2	0	8	0	0	0	0	0	0	0	0	0	0	0	0
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	-	0.0141	0.0066	0.0368	<0.0010	0.0232	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0016	<0.0040
		FS01_GW	Water	Interlab_D	1016189	0.010	0.012	0.005	0.050	<0.001	0.021	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
RPD						-	16	28	30	0	10	0	0	0	0	0	0	0	0	0	0	0	0
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	-	0.0141	0.0066	0.0368	<0.0010	0.0232	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0005	<0.0005	<0.0005	<0.0016	<0.0016	<0.0016	<0.0040
		FS01_GW	Water	Interlab_D	1016189	0.009	0.012	0.005	0.030	<0.001	0.017	<0.001	0.010	0.006	0.008	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
RPD						-	16	28	20	0	31	0	21	116	133	0	0	0	0	0	0	0	0
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	-	2.03	2.62	16.5	0.803	9.62	<0.0317	0.644	1.08	4.89	0.590	1.02	<0.0317	<0.0317	<0.0317	<0.0317	<0.0317	<0.0794
		FD02_GW	Water	Field_D	EB2325216	-	2.05	2.36	15.0	1.28	9.82	<0.0032	0.588	1.14	4.30	0.651	1.07	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080
RPD						-	1	10	10	46	2	0	9	5	13	10	5	0	0	0	0	0	0
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	-	2.03	2.62	16.5	0.803	9.62	<0.0317	0.644	1.08	4.89	0.590	1.02	<0.0317	<0.0317	<0.0317	<0.0317	<0.0317	<0.0794
		FS02_GW	Water	Interlab_D	1018509	1.1	1.7	1.4	15	1.4	15	<0.001	0.59	0.68	5.4	0.68	1.2	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
RPD						-	18	61	10	54	44	0	9	45	10	14	16	0	0	0	0	0	0
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	-	2.03	2.62	16.5	0.803	9.62	<0.0317	0.644	1.08	4.89	0.590	1.02	<0.0317	<0.0317	<0.0317	<0.0317	<0.0317	<0.0794
		FS02_GW	Water	Interlab_D	1018509	0.17	1.7	1.9	15	0.90	9.7	<0.001	0.95	1.5	6.2	0.48	0.94	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
RPD						-	18	32	10	11	1	0	38	33	24	21	8	0	0	0	0	0	0

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

						PFAS - Perfluoroalkyl Sulfonamide							PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums					PFAS	
						Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS + PFOA)*	PFAS (Sum of Total)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	PFAS (Sum of Total)(WA DER List)	Perfluorononane sulfonate (PFNS)	PFBA (TOPA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.0005	0.001	0.001	0.0005	0.001	0.001	0.0005	0.001	0.001	0.001	0.001	0.0002	0.001	0.0002	0.001	0.0002	0.001	0.01
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**																		
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	<0.0016	<0.004	<0.004	<0.0016	<0.004	<0.004	<0.0016	<0.002	<0.001	<0.001	<0.002	0.0600	-	0.0807	-	0.0741	-	0.01
		FD01_GW	Water	Field_D	EB2324549	<0.0016	<0.004	<0.004	<0.0016	<0.004	<0.004	<0.0016	<0.002	<0.001	<0.001	<0.002	0.0590	-	0.0797	-	0.0725	-	<0.01
RPD						0	0	0	0	0	0	0	0	0	0	0	2	-	1	-	2	-	0
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	<0.0016	<0.004	<0.004	<0.0016	<0.004	<0.004	<0.0016	<0.002	<0.001	<0.001	<0.002	0.0600	-	0.0807	-	0.0741	-	0.01
		FS01_GW	Water	Interlab_D	1016189	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.001	<0.001	0.071	0.021	0.098	0.071	0.083	<0.001	-
RPD						0	0	0	0	0	0	0	0	0	0	0	17	-	19	-	11	-	-
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	<0.0016	<0.004	<0.004	<0.0016	<0.004	<0.004	<0.0016	<0.002	<0.001	<0.001	<0.002	0.0600	-	0.0807	-	0.0741	-	0.01
		FS01_GW	Water	Interlab_D	1016189	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.001	<0.001	0.047	0.017	0.097	0.047	0.083	<0.001	-
RPD						0	0	0	0	0	0	0	0	0	0	0	24	-	18	-	11	-	-
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	<0.0317	<0.079	<0.079	<0.0317	<0.079	<0.079	<0.0317	<0.032	<0.032	<0.032	<0.032	26.1	-	39.8	-	36.4	-	1.12
		FD02_GW	Water	Field_D	EB2325216	<0.0032	<0.008	<0.008	<0.0032	<0.008	<0.008	<0.0032	<0.003	0.008	<0.003	<0.003	24.8	-	38.3	-	34.6	-	1.17
RPD						0	0	0	0	0	0	0	0	0	0	0	5	-	4	-	5	-	4
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	<0.0317	<0.079	<0.079	<0.0317	<0.079	<0.079	<0.0317	<0.032	<0.032	<0.032	<0.032	26.1	-	39.8	-	36.4	-	1.12
		FS02_GW	Water	Interlab_D	1018509	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.001	<0.001	30	16.2	44.151	31.2	40.25	<0.001	-
RPD						0	0	0	0	0	0	0	0	0	0	0	14	-	10	-	10	-	-
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	<0.0317	<0.079	<0.079	<0.0317	<0.079	<0.079	<0.0317	<0.032	<0.032	<0.032	<0.032	26.1	-	39.8	-	36.4	-	1.12
		FS02_GW	Water	Interlab_D	1018509	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.001	<0.001	24.7	10.64	39.44	25.64	36.47	<0.001	-
RPD						0	0	0	0	0	0	0	0	0	0	0	6	-	1	-	0	-	-

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

						PFAS TOPA - Perfluoroalkyl Carboxylic Acids										PFAS TOPA - Perfluoroalkyl Sulfonic Acids							
						PFPeA (TOPA)	PFHxA (TOPA)	PFHpA (TOPA)	PFOA (TOPA)	PFNA (TOPA)	PFDA (TOPA)	PFUnDA (TOPA)	PFDoDA (TOPA)	PFTrDA (TOPA)	PFTeDA (TOPA)	PFBS (TOPA)	PFPeS (TOPA)	PFHxS (TOPA)	PFHpS (TOPA)	PFOS (TOPA)	PFDS (TOPA)	FOSA (TOPA)	MeFOSA (TOPA)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**																		
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	0.013	0.008	0.033	<0.002	0.019	<0.002	<0.002	<0.005
		FD01_GW	Water	Field_D	EB2324549	<0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	0.013	0.008	0.035	<0.002	0.023	<0.002	<0.002	<0.005
RPD						0	15	0	0	0	0	0	0	0	0	0	0	6	0	19	0	0	0
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	0.013	0.008	0.033	<0.002	0.019	<0.002	<0.002	<0.005
		FS01_GW	Water	Interlab_D	1016189	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	0.013	0.008	0.033	<0.002	0.019	<0.002	<0.002	<0.005
		FS01_GW	Water	Interlab_D	1016189	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	1.61	7.03	0.605	1.10	<0.049	<0.049	<0.049	<0.049	<0.049	<0.122	2.02	2.33	15.2	0.800	8.35	<0.049	<0.049	<0.122
		FD02_GW	Water	Field_D	EB2325216	1.62	7.29	0.601	1.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.012	1.96	2.66	17.8	1.12	8.28	<0.005	<0.005	<0.012
RPD						1	4	1	5	0	0	0	0	0	0	3	13	16	33	1	0	0	0
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	1.61	7.03	0.605	1.10	<0.049	<0.049	<0.049	<0.049	<0.049	<0.122	2.02	2.33	15.2	0.800	8.35	<0.049	<0.049	<0.122
		FS02_GW	Water	Interlab_D	1018509	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	1.61	7.03	0.605	1.10	<0.049	<0.049	<0.049	<0.049	<0.049	<0.122	2.02	2.33	15.2	0.800	8.35	<0.049	<0.049	<0.122
		FS02_GW	Water	Interlab_D	1018509	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

						PFAS TOPA - Perfluoroalkyl Sulfonamide					PFAS TOPA - Fluorotelomer Sulfonic Acids				PFAS TOPA - Sums			
						EtFOSA (TOPA)	MeFOSAA (TOPA)	MeFOSE (TOPA)	EtFOSE (TOPA)	EtFOSAA (TOPA)	4:2 FTS (TOPA)	6:2 FTS (TOPA)	8:2 FTS (TOPA)	10:2 FTS (TOPA)	Sum of PFHxS and PFOS (TOPA)	Sum of PFAS	Sum of TOP C4 - C14 as Fluorine	Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfo_
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.005	0.002	0.005	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.002	0.002
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**													
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	0.052	0.089	0.055	0.089
		FD01_GW	Water	Field_D	EB2324549	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	0.058	0.086	0.053	0.086
RPD						0	0	0	0	0	0	0	0	0	11	3	4	3
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	0.052	0.089	0.055	0.089
		FS01_GW	Water	Interlab_D	1016189	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-
MW82	07 Aug 2023	MW82_PT_01	Water	Normal	EB2324549	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	0.052	0.089	0.055	0.089
		FS01_GW	Water	Interlab_D	1016189	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	<0.122	<0.049	<0.122	<0.122	<0.049	<0.049	<0.049	<0.049	<0.049	23.6	40.2	25.4	40.2
		FD02_GW	Water	Field_D	EB2325216	<0.012	<0.005	<0.012	<0.012	<0.005	<0.005	<0.005	<0.005	<0.005	26.1	43.6	27.5	43.6
RPD						0	0	0	0	0	0	0	0	0	10	8	8	8
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	<0.122	<0.049	<0.122	<0.122	<0.049	<0.049	<0.049	<0.049	<0.049	23.6	40.2	25.4	40.2
		FS02_GW	Water	Interlab_D	1018509	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-
MW84	14 Aug 2023	MW84_GW	Water	Normal	EB2325216	<0.122	<0.049	<0.122	<0.122	<0.049	<0.049	<0.049	<0.049	<0.049	23.6	40.2	25.4	40.2
		FS02_GW	Water	Interlab_D	1018509	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD						-	-	-	-	-	-	-	-	-	-	-	-	-

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

Appendix D

Laboratory certificates

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2323957**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: maria.prskalo@ghd.com	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 3316 3333	Facsimile	: +61-7-3243 7218
Project	: 12609270	Page	: 1 of 2
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/005)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: BRIAN LLEWELLYN		

Dates

Date Samples Received	: 04-Aug-2023 09:10	Issue Date	: 07-Aug-2023
Client Requested Due Date	: 11-Aug-2023	Scheduled Reporting Date	: **11-Aug-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 12.1°C - Ice Bricks present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please be advised that where you have requested 'Dissolved' metals, the laboratory will filter an aliquot from the non-preserved plastic (ALS Green label) container, however this is a non-compliant container/process and this should be taken into consideration when reviewing the metals data. Additional charges will be incurred for laboratory filtration.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP040 Total Organic Fluorine (TOF)	WATER - EP231X-LL (TOP) PFAS - Total Oxidisable Precursor (TOP) Assay -	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-13 Extended Water Suite A
EB2323957-001	02-Aug-2023 00:00	MW83_PT_01	✓	✓	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

MARIA PRSKALO

- *AU Certificate of Analysis - NATA (COA)	Email	maria.prskalo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	maria.prskalo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	maria.prskalo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	maria.prskalo@ghd.com
- A4 - AU Tax Invoice (INV)	Email	maria.prskalo@ghd.com
- Chain of Custody (CoC) (COC)	Email	maria.prskalo@ghd.com
- EDI Format - XTab (XTAB)	Email	maria.prskalo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	maria.prskalo@ghd.com

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph. 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

Environmental Division Brisbane
Work Order Reference
EB2323957

Telephone : – 61-7-3243 7222

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORAT
OFFICE: Brisbane		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intac
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ic receipt?
ORDER NUMBER:		COC: (1) 2 3 4 5 6 7	Random Sample
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910	OF: (1) 2 3 4 5 6 7	Other comment:
SAMPLER: Brian Llewellyn	SAMPLER MOBILE: 0409 939 243	RELINQUISHED BY: B Llewellyn	RECEIVED BY: EH
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 3.8.23 1040	DATE/TIME: 04.08.23 0910
Email Reports to: maria.prskalo@ghd.com			
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com			

RELINQUISHED BY: DATE/TIME: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	NT13 Extended Water Suite A	EA025H Suspended solids - standard level	EG020F Dissolved metals (Fe, Mn)	EG005T Total metals (Fe, Mn)	EP231X-SUT PFAS – Super Ultra Trace Full Suite (28 analytes)	EP231X-LL (TOP) PFAS – Low level TOPA (28 analytes)	EP040 Total Organo Fluorine		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MW83_PT_01	2/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X		
				TOTAL:	9	1	1	1	1	1	1	1		

HT

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2323957**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023 09:10
Order number	: ----	Date Analysis Commenced	: 05-Aug-2023
C-O-C number	: ----	Issue Date	: 11-Aug-2023 17:32
Sampler	: BRIAN LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Morgan Lennox	Senior Organic Chemist	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- It is recognised that EG020T (Total Metals by ICP-MS) is less than EG020F (Dissolved Metals by ICP-MS) for 'MW83_PT_01' (EB2323957-001). However, the difference is within experimental variation of the methods.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP040: Total Organic Fluorine (TOF) in waters and leachates represents the total fluorine in the organic forms which can be extracted by the SPE method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW83_PT_01	----	----	----	----
				Sampling date / time	02-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323957-001	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.25**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**8400**	----	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		**5460**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**32**	----	----	----	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		**2800**	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**341**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**341**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1300**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1940**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**347**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**469**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**949**	----	----	----	----
Potassium	7440-09-7	1	mg/L		<1	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		**1.30**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		**1.12**	----	----	----	----
Iron	7439-89-6	0.05	mg/L		**0.72**	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.8**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.07**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW83_PT_01	----	----	----	----
				Sampling date / time	02-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323957-001	--------	--------	--------	--------
					Result	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**88.6**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**97.2**	----	----	----	----
ø Ionic Balance	----	0.01	%		**4.62**	----	----	----	----
EP040: Total Organic Fluorine (TOF)									
Total Organic Fluorine	----	20	µg/L		<20	----	----	----	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		**0.014**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		**0.010**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		**0.057**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		**0.058**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		**0.006**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW83_PT_01	----	----	----	----
				Sampling date / time	02-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323957-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	----	----	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		**0.145**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW83_PT_01	----	----	----	----
				Sampling date / time	02-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323957-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231_TOP_P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		**0.115**	----	----	----	----
^ **Sum of TOP C4 - C14 as Fluorine**	----	0.002	µg/L		**0.090**	----	----	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		**0.145**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0131**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0087**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0555**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0025**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0645**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW83_PT_01	----	----	----	----
				Sampling date / time	02-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323957-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.120**	----	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.133**	----	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		**0.144**	----	----	----	----
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**80.9**	----	----	----	----
13C8-PFOA	----	0.002	%		**80.8**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**98.2**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW83_PT_01	----	----	----	----
				Sampling date / time	02-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323957-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**100**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	34	137
13C8-PFOA	----	56	129
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2323957**	Page	: 1 of 10
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
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Project	: 12609270	Date Samples Received	: 04-Aug-2023
Order number	: ----	Date Analysis Commenced	: 05-Aug-2023
C-O-C number	: ----	Issue Date	: 11-Aug-2023
Sampler	: BRIAN LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Morgan Lennox	Senior Organic Chemist	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP040: Total Organic Fluorine (TOF) (QC Lot: 5216528)									
EB2323957-001	MW83_PT_01	EP040: Total Organic Fluorine	----	20	µg/L	<20	<20	0.0	No Limit
EA005P: pH by PC Titrator (QC Lot: 5216616)									
EB2323915-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.49	7.59	1.3	0% - 20%
EB2323948-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.05	8.04	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5216618)									
EB2323915-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	288	288	0.0	0% - 20%
EB2323948-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2580	2580	0.2	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5221100)									
EB2323495-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EB2324131-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5216620)									
EB2323915-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	59	60	2.3	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	59	60	2.3	0% - 20%
EB2323948-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1080	1080	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1080	1080	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5216614)									
EB2323895-017	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	36	40	8.7	0% - 20%
EB2323573-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1730	1720	0.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5216615)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 5216615) - continued									
EB2323895-017	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	28	29	0.0	0% - 20%
EB2323573-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	11500	11400	0.8	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5223208)									
EB2323957-001	MW83_PT_01	ED093F: Calcium	7440-70-2	1	mg/L	347	340	2.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	469	458	2.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	949	952	0.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5223206)									
EB2323546-053	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.363	0.383	5.4	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.16	0.17	0.0	No Limit
EB2323957-001	MW83_PT_01	EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.30	1.28	1.0	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5223268)									
EB2323940-001	Anonymous	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.010	0.009	0.0	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.40	0.40	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5216622)									
EB2323915-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.7	0.8	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5216878)									
EB2323930-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.27	0.26	0.0	No Limit
EB2323732-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	94.4	94.4	0.1	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5216612)									
EB2323895-017	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.03	0.03	0.0	No Limit
EB2323573-010	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5216875)									
EB2323930-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.40	1.38	1.4	0% - 20%
EB2323732-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	21.3	21.6	1.3	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5216613)									
EB2323895-017	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.11	0.10	13.7	0% - 50%
EB2323573-010	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5217665)									
EB2323724-001	Anonymous	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	0.0008	0.0008	0.0	No Limit
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0006	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5217665) - continued									
EB2323724-001	Anonymous	EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5217665)									
EB2323724-001	Anonymous	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	<0.0020	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5217665)									
EB2323724-001	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5217665)									
EB2323724-001	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	0.015	0.015	0.0	0% - 50%
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5217665) - continued									
EB2323724-001	Anonymous	EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5217665)									
EB2323724-001	Anonymous	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0008	0.0008	0.0	No Limit
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.0164	0.0158	3.7	0% - 20%
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	0.0164	0.0158	3.7	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP040: Total Organic Fluorine (TOF) (QCLot: 5216528)								
EP040: Total Organic Fluorine	----	20	µg/L	<20	477 µg/L	83.2	70.0	120
EA005P: pH by PC Titrator (QCLot: 5216616)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.7	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5216618)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	98.3	90.0	106
				<1	12890 µS/cm	98.2	90.0	106
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5221100)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	96.3	88.0	112
				<5	1000 mg/L	100	88.0	112
				<5	926 mg/L	93.0	84.8	116
ED037P: Alkalinity by PC Titrator (QCLot: 5216620)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	100	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5216614)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.5	85.0	118
				<1	100 mg/L	96.4	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 5216615)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.7	90.0	115
				<1	1000 mg/L	100	90.0	115
ED093F: Dissolved Major Cations (QCLot: 5223208)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	106	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 5223206)								
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.7	89.0	120
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 5223268)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	101	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	102	82.0	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK040P: Fluoride by PC Titrator (QCLot: 5216622)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	95.3	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5216878)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	94.7	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5216612)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	98.7	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5216875)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	92.8	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5216613)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	99.0	81.7	117
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5216527)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.475 µg/L	89.7	44.9	136
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.465 µg/L	85.2	33.2	116
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5216527)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	----	----	----	----
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.5 µg/L	94.2	47.0	123
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5216527)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5216527) - continued								
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5216527)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.0476 µg/L	0.2	0	200
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_P: PFAS Sums (QCLot: 5216527)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5217665)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	126	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	125	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	102	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	127	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	124	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	120	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5217665)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	121	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	124	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	122	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	125	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	122	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	127	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	121	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	128	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	108	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	107	65.0	144

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5217665) - continued								
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	121	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5217665)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	122	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	126	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	130	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	114	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	132	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	122	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	135	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5217665)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	131	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	138	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	125	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	115	53.1	133
EP231P: PFAS Sums (QCLot: 5217665)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5216614)							
EB2323895-016	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	96.0	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5216615)							
EB2323895-016	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	112	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020F: Dissolved Metals by ICP-MS (QCLot: 5223206)							
EB2323546-054	Anonymous	EG020A-F: Manganese	7439-96-5	2 mg/L	87.9	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5223268)							
EB2323957-001	MW83_PT_01	EG020A-T: Manganese	7439-96-5	1 mg/L	89.6	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5216622)							
EB2323573-011	Anonymous	EK040P: Fluoride	16984-48-8	10 mg/L	98.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5216878)							
EB2323875-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	122	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5216612)							
EB2323895-016	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	101	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5216875)							
EB2323875-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	125	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5216613)							
EB2323895-016	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	104	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2323957**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023
Site	:	Issue Date	: 11-Aug-2023
Sampler	: BRIAN LLEWELLYN	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
MW83_PT_01	----	----	----	07-Aug-2023	03-Aug-2023	**4**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
MW83_PT_01	----	----	----	05-Aug-2023	04-Aug-2023	**1**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
MW83_PT_01	----	----	----	05-Aug-2023	04-Aug-2023	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PFAS by LCMSMS after SPE and oxidation (TOP)	0	1	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
MW83_PT_01	**02-Aug-2023**	**----**	----	----	**07-Aug-2023**	03-Aug-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
MW83_PT_01	**02-Aug-2023**	**----**	----	----	**07-Aug-2023**	30-Aug-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) MW83_PT_01	02-Aug-2023	----	----	----	08-Aug-2023	09-Aug-2023	✓
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) MW83_PT_01	02-Aug-2023	----	----	----	10-Aug-2023	30-Aug-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) MW83_PT_01	02-Aug-2023	----	----	----	07-Aug-2023	16-Aug-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) MW83_PT_01	02-Aug-2023	----	----	----	05-Aug-2023	30-Aug-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) MW83_PT_01	02-Aug-2023	----	----	----	05-Aug-2023	30-Aug-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) MW83_PT_01	02-Aug-2023	----	----	----	10-Aug-2023	30-Aug-2023	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) MW83_PT_01	02-Aug-2023	----	----	----	10-Aug-2023	29-Jan-2024	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T) MW83_PT_01	02-Aug-2023	10-Aug-2023	29-Jan-2024	✓	10-Aug-2023	29-Jan-2024	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P) MW83_PT_01	02-Aug-2023	----	----	----	07-Aug-2023	30-Aug-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW83_PT_01	02-Aug-2023	----	----	----	05-Aug-2023	30-Aug-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) MW83_PT_01	02-Aug-2023	----	----	----	05-Aug-2023	04-Aug-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW83_PT_01	02-Aug-2023	----	----	----	05-Aug-2023	30-Aug-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) MW83_PT_01	02-Aug-2023	----	----	----	05-Aug-2023	04-Aug-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP040: Total Organic Fluorine (TOF)							
HDPE (no PTFE) (EP040)							
MW83_PT_01	02-Aug-2023	05-Aug-2023	30-Aug-2023	✓	07-Aug-2023	30-Aug-2023	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW83_PT_01	02-Aug-2023	07-Aug-2023	29-Jan-2024	✓	09-Aug-2023	29-Jan-2024	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW83_PT_01	02-Aug-2023	07-Aug-2023	29-Jan-2024	✓	09-Aug-2023	29-Jan-2024	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW83_PT_01	02-Aug-2023	07-Aug-2023	29-Jan-2024	✓	09-Aug-2023	29-Jan-2024	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW83_PT_01	02-Aug-2023	07-Aug-2023	29-Jan-2024	✓	09-Aug-2023	29-Jan-2024	✓
EP231_TOP_P: PFAS Sums							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW83_PT_01	02-Aug-2023	07-Aug-2023	29-Jan-2024	✓	09-Aug-2023	29-Jan-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT)							
MW83_PT_01	02-Aug-2023	07-Aug-2023	29-Jan-2024	✓	09-Aug-2023	29-Jan-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT)							
MW83_PT_01	02-Aug-2023	07-Aug-2023	29-Jan-2024	✓	09-Aug-2023	29-Jan-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT)							
MW83_PT_01	02-Aug-2023	07-Aug-2023	29-Jan-2024	✓	09-Aug-2023	29-Jan-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT)							
MW83_PT_01	02-Aug-2023	07-Aug-2023	29-Jan-2024	✓	09-Aug-2023	29-Jan-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT)							
MW83_PT_01	02-Aug-2023	07-Aug-2023	29-Jan-2024	✓	09-Aug-2023	29-Jan-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	4	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	0	1	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	16	**18.75**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Ammonia as N by Discrete analyser	EK055G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	6	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Total Organic Fluorine (TOF)	EP040	WATER	In house: Fluorinated organic compounds are isolated from the sample by adsorption onto activated carbon. Hydropyrolytic combustion of the SPE extract converts organic forms of fluorine to hydrogen fluoride (HF). The HF is adsorbed in a trapping solution and the total fluoride concentration determined by Ion Chromatography (IC).
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349. Sample extracts are analysed by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Total Organic Fluorine Preparation - Waters	EP040-PR	WATER	In house - Fluorinated organic compounds are isolated by Solid Phase Extraction (SPE). Inorganic fluorine is displaced by washing with water and organic forms eluted with Methanol.

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Precuror Digest for PFAS - Low Level	* ORG70-SPE	WATER	In-House SPE followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349: A 50 mL sample is concentrated by SPE, taken to near dryness and made up to 5 mL in a reagent solution. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2324241**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: maria.prskalo@ghd.com	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 3316 3333	Facsimile	: +61-7-3243 7218
Project	: 12609270	Page	: 1 of 3
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/005)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: B. LLEWELLYN		

Dates

Date Samples Received	: 08-Aug-2023 08:10	Issue Date	: 08-Aug-2023
Client Requested Due Date	: 15-Aug-2023	Scheduled Reporting Date	: **15-Aug-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 1.4°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please be advised that where “EG005T Total Metals” analysis is requested on the Chain of Custody, “EG020T – Total Metals” analysis has been assigned as this is the standard total metals analysis assigned for samples with a water matrix. If you wish to discuss this, please contact client services at ALSEnviro.Brisbane@alsglobal.com**
- **Please note where you have asked for 'Dissolved' metals for samples "MW81_PT_01" and "MW81_PT_02", the laboratory will filter an aliquot from the non-preserved plastic (ALS Green label) container for this analysis, however this is a non-compliant container/process and should be taken into consideration when reviewing the metals data. Additional charges will be incurred for laboratory filtration.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method Sample ID	Sample Container Received	Preferred Sample Container for Analysis
Dissolved Metals by ICP-MS - Suite A : EG020A-F		
MW81_PT_01	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
MW81_PT_02	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EG020T Total Metals by ICP/MS (including digestion)	WATER - EP040 Total Organic Fluorine (TOF)	WATER - EP231X-LL (TOP) PFAS - Total Oxidisable Precursor (TOP) Assay -	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-13 Extended Water Suite A
EB2324241-001	04-Aug-2023 00:00	MW81_PT_01	✓	✓	✓	✓	✓	✓	✓
EB2324241-002	04-Aug-2023 00:00	MW81_PT_02	✓	✓	✓	✓	✓	✓	✓
EB2324241-003	05-Aug-2023 00:00	RS02_GW				✓	✓	✓	

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received Date	Samples Received Evaluation	Instructions Received Date	Instructions Received Evaluation
EA005-P: pH by Auto Titrator							
MW81_PT_01	Clear Plastic Bottle - Natural	----	04-Aug-2023	08-Aug-2023	×	----	----
MW81_PT_02	Clear Plastic Bottle - Natural	----	04-Aug-2023	08-Aug-2023	×	----	----
EK057G: Nitrite as N by Discrete Analyser							
MW81_PT_01	Clear Plastic Bottle - Natural	----	06-Aug-2023	08-Aug-2023	×	----	----
MW81_PT_02	Clear Plastic Bottle - Natural	----	06-Aug-2023	08-Aug-2023	×	----	----
EK071G: Reactive Phosphorus as P-By Discrete Analyser							
MW81_PT_01	Clear Plastic Bottle - Natural	----	06-Aug-2023	08-Aug-2023	×	----	----
MW81_PT_02	Clear Plastic Bottle - Natural	----	06-Aug-2023	08-Aug-2023	×	----	----

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

MARIA PRSKALO

- *AU Certificate of Analysis - NATA (COA)	Email	maria.prskalo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	maria.prskalo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	maria.prskalo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	maria.prskalo@ghd.com
- A4 - AU Tax Invoice (INV)	Email	maria.prskalo@ghd.com
- Chain of Custody (CoC) (COC)	Email	maria.prskalo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	maria.prskalo@ghd.com
- EDI Format - XTab (XTAB)	Email	maria.prskalo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	maria.prskalo@ghd.com

MELANIE WRIGHT

- A4 - AU Tax Invoice (INV)	Email	Melanie.Wright@ghd.com

Environmental Division
Brisbane
Work Order Reference
EB2324241

ALS Environmental

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYD Ph: 02
☐TOWNS Ph: 07 479
☐WOLLON Ph: 02 422

Telephone : + 61-7-3243 7222

CLIENT: GHD	TURNAROUND REQUIREMENTS: ☑ Standard TAT (List due date):	FOR LABORATORY US	
OFFICE: Brisbane	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):		
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	COC SEQUENCE NUMBER (Circle)	
ORDER NUMBER:		COC: (1) 2 3 4 5 6 7	
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910	OF: (1) 2 3 4 5 6 7	
SAMPLER: B. LLEWELLYN	SAMPLER MOBILE: 0409 939 243		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):		
Email Reports to: maria.prskalo@ghd.com			
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com; melanie.wright@ghd.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
M. PRSKALO			
DATE/TIME: 07/08/2023 12:00pm	DATE/TIME: 8/8/23 0810	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB USE	SAMPLE DETAILS (MATRIX: SOLID (S) WATER (W))			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	NT13 Extended Water Suite A	EA025H Suspended solids - standard level	EG020F Dissolved metals (Fe, Mn)	EG005T Total metals (Fe, Mn)	EP231X-SUT PFAS – Super Ultra Trace Full Suite (28 analytes)	EP231X-LL (TOP) PFAS – Low level TOPA (28 analytes)	EP040 Total Organo Fluorine		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	MW81_PT_01	04/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X		
	MW81_PT_02	04/08/2023	W	" "	9	X	X	X	X	X	X	X		
	RS02_GW	05/08/2023	W	2x125mL, 2x20mL, 1x60mL	5					X	X	X		
				TOTAL	23	2	2	2	2	3	3	3		

HT

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2324241**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 08-Aug-2023 08:10
Order number	: ----	Date Analysis Commenced	: 08-Aug-2023
C-O-C number	: ----	Issue Date	: 15-Aug-2023 11:34
Sampler	: B. LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X-SUT PFAS Super Ultra Trace: The LOR values for particular analytes have been raised in samples ‘MW81_PT_01’ (EB2324241-001) and ‘MW81_PT_02’ (EB2324241-002) due to matrix interference.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP040: Total Organic Fluorine (TOF) in waters and leachates represents the total fluorine in the organic forms which can be extracted by the SPE method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW81_PT_01	MW81_PT_02	RS02_GW	MW81_PT_01 Metals Analysis	MW81_PT_02 Metals Analysis
				Sampling date / time	04-Aug-2023 00:00	04-Aug-2023 00:00	05-Aug-2023 00:00	04-Aug-2023 00:00	04-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324241-001	EB2324241-002	EB2324241-003	EB2324241-004	EB2324241-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.56**	**7.44**	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**6600**	**6640**	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		**4290**	**4320**	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	<5	----	----	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		**3330**	**3230**	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**432**	**432**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**432**	**432**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1270**	**1300**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1620**	**1650**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**290**	**284**	----	----	----
Magnesium	7439-95-4	1	mg/L		**632**	**613**	----	----	----
Sodium	7440-23-5	1	mg/L		**458**	**423**	----	----	----
Potassium	7440-09-7	1	mg/L		<1	<1	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		----	----	----	**0.013**	**0.011**
Iron	7439-89-6	0.05	mg/L		----	----	----	<0.05	<0.05
EG020T: Total Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		----	----	----	**0.013**	**0.011**
Iron	7439-89-6	0.05	mg/L		----	----	----	<0.05	<0.05
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.5**	**0.4**	----	----	----
EK055G: Ammonia as N by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW81_PT_01	MW81_PT_02	RS02_GW	MW81_PT_01 Metals Analysis	MW81_PT_02 Metals Analysis
				Sampling date / time	04-Aug-2023 00:00	04-Aug-2023 00:00	05-Aug-2023 00:00	04-Aug-2023 00:00	04-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324241-001	EB2324241-002	EB2324241-003	EB2324241-004	EB2324241-005
					Result	Result	Result	Result	Result
EK055G: Ammonia as N by Discrete Analyser - Continued									
Ammonia as N	7664-41-7	0.01	mg/L		**0.03**	**0.02**	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**80.8**	**82.2**	----	----	----
ø Total Cations	----	0.01	meq/L		**86.4**	**83.0**	----	----	----
ø Ionic Balance	----	0.01	%		**3.37**	**0.47**	----	----	----
EP040: Total Organic Fluorine (TOF)									
Total Organic Fluorine	----	20	µg/L		<20	<20	<20	----	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		**0.013**	**0.029**	<0.002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		**0.012**	**0.032**	<0.002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		**0.073**	**0.200**	<0.002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		**0.003**	**0.007**	<0.002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		**0.053**	**0.102**	<0.002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.002	<0.002	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.01	**0.01**	<0.01	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	**0.005**	<0.002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		**0.007**	**0.017**	<0.002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	**0.004**	<0.002	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW81_PT_01	MW81_PT_02	RS02_GW	MW81_PT_01 Metals Analysis	MW81_PT_02 Metals Analysis
				Sampling date / time	04-Aug-2023 00:00	04-Aug-2023 00:00	05-Aug-2023 00:00	04-Aug-2023 00:00	04-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324241-001	EB2324241-002	EB2324241-003	EB2324241-004	EB2324241-005
					Result	Result	Result	Result	Result
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.005	<0.005	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.002	<0.002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.002	<0.002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.002	<0.002	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	<0.005	<0.005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	<0.005	<0.005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	<0.005	<0.005	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW81_PT_01	MW81_PT_02	RS02_GW	MW81_PT_01 Metals Analysis	MW81_PT_02 Metals Analysis
				Sampling date / time	04-Aug-2023 00:00	04-Aug-2023 00:00	05-Aug-2023 00:00	04-Aug-2023 00:00	04-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324241-001	EB2324241-002	EB2324241-003	EB2324241-004	EB2324241-005
					Result	Result	Result	Result	Result
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	<0.005	<0.005	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		**0.161**	**0.406**	<0.002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		**0.126**	**0.302**	<0.002	----	----
^ **Sum of TOP C4 - C14 as Fluorine**	----	0.002	µg/L		**0.100**	**0.253**	<0.002	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		**0.161**	**0.406**	<0.002	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0169**	**0.0329**	<0.0005	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0110**	**0.0264**	<0.0005	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0881**	**0.225**	<0.0005	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0037**	**0.0083**	<0.0005	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0459**	**0.0828**	**0.0003**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0077	<0.0077	<0.0020	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0015	<0.0015	<0.0005	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0015	<0.0015	<0.0005	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0015	<0.0052	<0.0005	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	**0.0023**	<0.0005	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW81_PT_01	MW81_PT_02	RS02_GW	MW81_PT_01 Metals Analysis	MW81_PT_02 Metals Analysis
				Sampling date / time	04-Aug-2023 00:00	04-Aug-2023 00:00	05-Aug-2023 00:00	04-Aug-2023 00:00	04-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324241-001	EB2324241-002	EB2324241-003	EB2324241-004	EB2324241-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0039	<0.0039	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.002	<0.002	<0.001	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.134**	**0.308**	**0.0003**	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.151**	**0.343**	**0.0003**	----	----
^ Sum of PFAS	----	0.0002	µg/L		**0.166**	**0.378**	**0.0003**	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW81_PT_01	MW81_PT_02	RS02_GW	MW81_PT_01 Metals Analysis	MW81_PT_02 Metals Analysis
				Sampling date / time	04-Aug-2023 00:00	04-Aug-2023 00:00	05-Aug-2023 00:00	04-Aug-2023 00:00	04-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324241-001	EB2324241-002	EB2324241-003	EB2324241-004	EB2324241-005
					Result	Result	Result	Result	Result
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		110	106	104	----	----
13C8-PFOA	----	0.002	%		99.9	108	115	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		97.8	93.2	100	----	----
13C8-PFOA	----	0.0005	%		102	94.3	98.7	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	34	137
13C8-PFOA	----	56	129
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2324241**	Page	: 1 of 10
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 08-Aug-2023
Order number	: ----	Date Analysis Commenced	: 08-Aug-2023
C-O-C number	: ----	Issue Date	: 15-Aug-2023
Sampler	: B. LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

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General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP040: Total Organic Fluorine (TOF) (QC Lot: 5222237)									
EB2323708-001	Anonymous	EP040: Total Organic Fluorine	----	20	µg/L	<20	<20	0.0	No Limit
EA005P: pH by PC Titrator (QC Lot: 5222147)									
EB2324204-009	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.72	7.77	0.6	0% - 20%
EB2324169-008	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	5.93	5.89	0.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5222143)									
EB2324204-009	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	115	116	0.9	0% - 20%
EB2324169-008	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	159	159	0.0	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5225782)									
EB2324066-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	576	588	2.1	0% - 20%
EB2324239-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5222145)									
EB2324204-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	36	39	7.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	36	39	7.5	0% - 20%
EB2324169-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	14	13	0.0	0% - 50%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	14	13	0.0	0% - 50%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5222161)									
EB2324227-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	7	7	0.0	No Limit
EB2324204-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5222162)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5222162) - continued									
EB2324243-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	557	567	1.9	0% - 20%
EB2324058-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	770000 µg/L	768	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5222157)									
EB2324227-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	82	86	4.4	0% - 20%
EB2324204-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2	2	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5222158)									
EB2324243-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	64	66	4.0	0% - 20%
EB2324058-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	265	268	1.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5222290)									
EB2324183-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2	2	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	1	1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	1740	1750	0.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EB2324204-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	9	8	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	3	3	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	10	10	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5222294)									
EB2324241-002	MW81_PT_02	ED093F: Calcium	7440-70-2	1	mg/L	284	302	6.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	613	635	3.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	423	446	5.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ET2303366-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	18	18	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	5	5	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	19	19	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	1	2	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5233152)									
EB2324241-004	MW81_PT_01 Metals Analysis	EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.013	0.013	0.0	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 5233151)									
EB2324241-004	MW81_PT_01 Metals Analysis	EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.013	0.013	0.0	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5222142)									
EB2324204-009	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EB2324169-008	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5222169)									
EB2324262-013	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.14	0.14	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5222169) - continued									
EB2324262-016	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.72	0.73	0.0	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5229139)									
EB2323975-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.24	0.22	4.8	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5222149)									
EB2324227-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2324204-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5222150)									
EB2324243-006	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2324058-005	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<10 µg/L	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5222166)									
EB2324262-013	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2324262-016	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.01	0.02	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5229138)									
EB2322351-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.66	1.62	2.3	0% - 20%
EB2323975-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.21	0.21	0.0	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5222153)									
EB2324227-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5222154)									
EB2324243-006	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2324058-005	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<10 µg/L	<0.01	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP040: Total Organic Fluorine (TOF) (QCLot: 5222237)								
EP040: Total Organic Fluorine	----	20	µg/L	<20	477 µg/L	100	70.0	120
EA005P: pH by PC Titrator (QCLot: 5222147)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.6	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5222143)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	97.0	90.0	106
				<1	12890 µS/cm	97.9	90.0	106
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5225782)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	98.9	88.0	112
				<5	1000 mg/L	101	88.0	112
				<5	926 mg/L	101	84.8	116
ED037P: Alkalinity by PC Titrator (QCLot: 5222145)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.6	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5222161)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	85.0	118
				<1	100 mg/L	97.0	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5222162)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.9	85.0	118
				<1	100 mg/L	94.6	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 5222157)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.0	90.0	115
				<1	1000 mg/L	101	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5222158)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.2	90.0	115
				<1	1000 mg/L	101	90.0	115
ED093F: Dissolved Major Cations (QCLot: 5222290)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	113	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	107	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.9	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5222294)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED093F: Dissolved Major Cations (QCLot: 5222294) - continued								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	111	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	107	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.7	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 5233152)								
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.0	89.0	120
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 5233151)								
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.2	88.0	114
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	118
EK040P: Fluoride by PC Titrator (QCLot: 5222142)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	101	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5222169)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	94.8	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5229139)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.45 mg/L	86.4	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5222149)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.6	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5222150)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	98.7	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5222166)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.1	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5229138)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	93.2	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5222153)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	93.4	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5222154)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	94.9	81.7	117
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5222236)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.475 µg/L	77.7	44.9	136
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.465 µg/L	83.8	33.2	116

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5222236) - continued								
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5222236)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	----	----	----	----
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.5 µg/L	89.9	47.0	123
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5222236)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5222236)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.0476 µg/L	-0.2	0	200
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_P: PFAS Sums (QCLot: 5222236)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L	<0.002	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_P: PFAS Sums (QCLot: 5222236) - continued								
EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5224453)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	108	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	115	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	119	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	113	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	108	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	99.7	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5224453)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	109	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	102	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	103	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	101	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	106	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	112	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	103	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	115	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	105	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	91.2	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	101	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5224453)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	108	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	108	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	114	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	94.7	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	100	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	99.6	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	132	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5224453)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5224453) - continued								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	94.1	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	104	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	118	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	127	53.1	133
EP231P: PFAS Sums (QCLot: 5224453)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP040: Total Organic Fluorine (TOF) (QCLot: 5222237)							
EB2323708-002	Anonymous	EP040: Total Organic Fluorine	----	477 µg/L	83.0	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5222161)							
EB2324227-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5222162)							
EB2324243-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5222157)							
EB2324227-004	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5222158)							
EB2324243-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	110	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 5233152)							
EB2324241-005	MW81_PT_02 Metals Analysis	EG020A-F: Manganese	7439-96-5	2 mg/L	99.2	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 5233151)							
EB2324241-005	MW81_PT_02 Metals Analysis	EG020A-T: Manganese	7439-96-5	1 mg/L	98.7	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5222142)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EK040P: Fluoride by PC Titrator (QCLot: 5222142) - continued							
EB2324241-002	MW81_PT_02	EK040P: Fluoride	16984-48-8	5 mg/L	80.0	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5222169)							
EB2324158-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	# Not Determined	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5229139)							
EB2324241-002	MW81_PT_02	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	85.7	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5222149)							
EB2324227-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	104	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5222150)							
EB2324243-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	103	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5222166)							
EB2324158-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	98.8	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5229138)							
EB2324241-002	MW81_PT_02	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	89.7	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5222153)							
EB2324227-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	105	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5222154)							
EB2324243-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	98.6	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2324241**	Page	: 1 of 10
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 08-Aug-2023
Site	:	Issue Date	: 15-Aug-2023
Sampler	: B. LLEWELLYN	No. of samples received	: 5
Order number	: ----	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2324227--004	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2324243--002	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2324227--004	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK055G: Ammonia as N by Discrete Analyser	EB2324158--001	Anonymous	**Ammonia as N**	7664-41-7	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
MW81_PT_01, MW81_PT_02	----	----	----	09-Aug-2023	04-Aug-2023	**5**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
MW81_PT_01, MW81_PT_02	----	----	----	08-Aug-2023	06-Aug-2023	**2**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
MW81_PT_01, MW81_PT_02	----	----	----	08-Aug-2023	06-Aug-2023	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC 0	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P)								
MW81_PT_01,	MW81_PT_02	**04-Aug-2023**	**----**	----	**----**	**09-Aug-2023**	04-Aug-2023	×
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P)								
MW81_PT_01,	MW81_PT_02	**04-Aug-2023**	**----**	----	**----**	**09-Aug-2023**	01-Sep-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C								
Clear Plastic Bottle - Natural (EA025H)								
MW81_PT_01,	MW81_PT_02	**04-Aug-2023**	**----**	----	**----**	**10-Aug-2023**	11-Aug-2023	✓
EA065: Total Hardness as CaCO3								
Clear Plastic Bottle - Natural (ED093F)								
MW81_PT_01,	MW81_PT_02	**04-Aug-2023**	**----**	----	**----**	**09-Aug-2023**	11-Aug-2023	✓
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
MW81_PT_01,	MW81_PT_02	**04-Aug-2023**	**----**	----	**----**	**09-Aug-2023**	18-Aug-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
MW81_PT_01,	MW81_PT_02	**04-Aug-2023**	**----**	----	**----**	**08-Aug-2023**	01-Sep-2023	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
MW81_PT_01,	MW81_PT_02	**04-Aug-2023**	**----**	----	**----**	**08-Aug-2023**	01-Sep-2023	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
MW81_PT_01,	MW81_PT_02	**04-Aug-2023**	**----**	----	**----**	**09-Aug-2023**	11-Aug-2023	✓
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)								
MW81_PT_01 - Metals Analysis,	MW81_PT_02 - Metals Analysis	**04-Aug-2023**	**----**	----	**----**	**14-Aug-2023**	31-Jan-2024	✓
EG020T: Total Metals by ICP-MS								
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)								
MW81_PT_01 - Metals Analysis,	MW81_PT_02 - Metals Analysis	**04-Aug-2023**	**14-Aug-2023**	31-Jan-2024	✓	**14-Aug-2023**	31-Jan-2024	✓
EK040P: Fluoride by PC Titrator								
Clear Plastic Bottle - Natural (EK040P)								
MW81_PT_01,	MW81_PT_02	**04-Aug-2023**	**----**	----	**----**	**09-Aug-2023**	01-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW81_PT_01	**04-Aug-2023**	**----**	----	----	**08-Aug-2023**	01-Sep-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW81_PT_02	**04-Aug-2023**	**----**	----	----	**11-Aug-2023**	01-Sep-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**----**	----	----	**08-Aug-2023**	06-Aug-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
MW81_PT_01	**04-Aug-2023**	**----**	----	----	**08-Aug-2023**	01-Sep-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
MW81_PT_02	**04-Aug-2023**	**----**	----	----	**11-Aug-2023**	01-Sep-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G)							
MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**----**	----	----	**08-Aug-2023**	06-Aug-2023	×
EP040: Total Organic Fluorine (TOF)							
HDPE (no PTFE) (EP040)							
MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	01-Sep-2023	✓	**10-Aug-2023**	01-Sep-2023	✓
HDPE (no PTFE) (EP040)							
RS02_GW	**05-Aug-2023**	**09-Aug-2023**	02-Sep-2023	✓	**10-Aug-2023**	02-Sep-2023	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	31-Jan-2024	✓	**10-Aug-2023**	31-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP))							
RS02_GW	**05-Aug-2023**	**09-Aug-2023**	01-Feb-2024	✓	**10-Aug-2023**	01-Feb-2024	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	31-Jan-2024	✓	**10-Aug-2023**	31-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP))							
RS02_GW	**05-Aug-2023**	**09-Aug-2023**	01-Feb-2024	✓	**10-Aug-2023**	01-Feb-2024	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	31-Jan-2024	✓	**10-Aug-2023**	31-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP))							
RS02_GW	**05-Aug-2023**	**09-Aug-2023**	01-Feb-2024	✓	**10-Aug-2023**	01-Feb-2024	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP))							
MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	31-Jan-2024	✓	**10-Aug-2023**	31-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP))							
RS02_GW	**05-Aug-2023**	**09-Aug-2023**	01-Feb-2024	✓	**10-Aug-2023**	01-Feb-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_P: PFAS Sums							
HDPE (no PTFE) (EP231X-LL (TOP)) MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	31-Jan-2024	✓	**10-Aug-2023**	31-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS02_GW	**05-Aug-2023**	**09-Aug-2023**	01-Feb-2024	✓	**10-Aug-2023**	01-Feb-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	31-Jan-2024	✓	**11-Aug-2023**	31-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS02_GW	**05-Aug-2023**	**09-Aug-2023**	01-Feb-2024	✓	**11-Aug-2023**	01-Feb-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	31-Jan-2024	✓	**11-Aug-2023**	31-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS02_GW	**05-Aug-2023**	**09-Aug-2023**	01-Feb-2024	✓	**11-Aug-2023**	01-Feb-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	31-Jan-2024	✓	**11-Aug-2023**	31-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS02_GW	**05-Aug-2023**	**09-Aug-2023**	01-Feb-2024	✓	**11-Aug-2023**	01-Feb-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	31-Jan-2024	✓	**11-Aug-2023**	31-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS02_GW	**05-Aug-2023**	**09-Aug-2023**	01-Feb-2024	✓	**11-Aug-2023**	01-Feb-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) MW81_PT_01, MW81_PT_02	**04-Aug-2023**	**09-Aug-2023**	31-Jan-2024	✓	**11-Aug-2023**	31-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS02_GW	**05-Aug-2023**	**09-Aug-2023**	01-Feb-2024	✓	**11-Aug-2023**	01-Feb-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	3	21	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	31	**12.90**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	23	**17.39**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	35	**11.43**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	7	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	0	7	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	20	**15.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	31	**12.90**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	14	**21.43**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Ammonia as N by Discrete analyser	EK055G	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	2	21	**9.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	31	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	7	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Total Organic Fluorine (TOF)	EP040	WATER	In house: Fluorinated organic compounds are isolated from the sample by adsorption onto activated carbon. Hydropyrolytic combustion of the SPE extract converts organic forms of fluorine to hydrogen fluoride (HF). The HF is adsorbed in a trapping solution and the total fluoride concentration determined by Ion Chromatography (IC).
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349. Sample extracts are analysed by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Total Organic Fluorine Preparation - Waters	EP040-PR	WATER	In house - Fluorinated organic compounds are isolated by Solid Phase Extraction (SPE). Inorganic fluorine is displaced by washing with water and organic forms eluted with Methanol.

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Precuror Digest for PFAS - Low Level	* ORG70-SPE	WATER	In-House SPE followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349: A 50 mL sample is concentrated by SPE, taken to near dryness and made up to 5 mL in a reagent solution. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2324549**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: maria.prskalo@ghd.com	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 3316 3333	Facsimile	: +61-7-3243 7218
Project	: 12609270	Page	: 1 of 3
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/005)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: MARIA PRSKALO		

Dates

Date Samples Received	: 10-Aug-2023 08:10	Issue Date	: 10-Aug-2023
Client Requested Due Date	: 18-Aug-2023	Scheduled Reporting Date	: **18-Aug-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 3.9°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EA025H Suspended Solids - Standard Level	WATER - EG005T Total Metals by ICPAES (including digestion)	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EP040 Total Organic Fluorine (TOF)	WATER - EP231X-LL (TOP) PFAS - Total Oxidisable Precursor (TOP) Assay -	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-13 Extended Water Suite A
EB2324549-001	07-Aug-2023 00:00	MW82_PT_01	✓	✓	✓	✓	✓	✓	✓
EB2324549-002	07-Aug-2023 00:00	MW82_PT_02	✓	✓	✓	✓	✓	✓	✓
EB2324549-003	07-Aug-2023 00:00	FD01_GW	✓	✓	✓	✓	✓	✓	✓
EB2324549-004	07-Aug-2023 00:00	RS01_GW	✓	✓		✓	✓	✓	✓
EB2324549-005	09-Aug-2023 00:00	RS03_GW	✓	✓		✓	✓	✓	✓
EB2324549-006	05-Aug-2023 00:00	RS02_GW	✓	✓					✓
EB2324549-007	07-Aug-2023 00:00	TB01_GW_210728						✓	

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA005-P: pH by Auto Titrator							
FD01_GW	Clear Plastic Bottle - Natural	----	07-Aug-2023	10-Aug-2023	×	----	----
MW82_PT_01	Clear Plastic Bottle - Natural	----	07-Aug-2023	10-Aug-2023	×	----	----
MW82_PT_02	Clear Plastic Bottle - Natural	----	07-Aug-2023	10-Aug-2023	×	----	----
RS01_GW	Clear Plastic Bottle - Natural	----	07-Aug-2023	10-Aug-2023	×	----	----
RS02_GW	Clear Plastic Bottle - Natural	----	05-Aug-2023	10-Aug-2023	×	----	----
RS03_GW	Clear Plastic Bottle - Natural	----	09-Aug-2023	10-Aug-2023	×	----	----
EK057G: Nitrite as N by Discrete Analyser							
FD01_GW	Clear Plastic Bottle - Natural	----	09-Aug-2023	10-Aug-2023	×	----	----
MW82_PT_01	Clear Plastic Bottle - Natural	----	09-Aug-2023	10-Aug-2023	×	----	----
MW82_PT_02	Clear Plastic Bottle - Natural	----	09-Aug-2023	10-Aug-2023	×	----	----
RS01_GW	Clear Plastic Bottle - Natural	----	09-Aug-2023	10-Aug-2023	×	----	----
RS02_GW	Clear Plastic Bottle - Natural	----	07-Aug-2023	10-Aug-2023	×	----	----
EK071G: Reactive Phosphorus as P-By Discrete Analyser							
FD01_GW	Clear Plastic Bottle - Natural	----	09-Aug-2023	10-Aug-2023	×	----	----
MW82_PT_01	Clear Plastic Bottle - Natural	----	09-Aug-2023	10-Aug-2023	×	----	----
MW82_PT_02	Clear Plastic Bottle - Natural	----	09-Aug-2023	10-Aug-2023	×	----	----
RS01_GW	Clear Plastic Bottle - Natural	----	09-Aug-2023	10-Aug-2023	×	----	----
RS02_GW	Clear Plastic Bottle - Natural	----	07-Aug-2023	10-Aug-2023	×	----	----

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

MARIA PRSKALO

- *AU Certificate of Analysis - NATA (COA)	Email	maria.prskalo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	maria.prskalo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	maria.prskalo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	maria.prskalo@ghd.com
- A4 - AU Tax Invoice (INV)	Email	maria.prskalo@ghd.com
- Chain of Custody (CoC) (COC)	Email	maria.prskalo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	maria.prskalo@ghd.com
- EDI Format - XTab (XTAB)	Email	maria.prskalo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	maria.prskalo@ghd.com

MELANIE WRIGHT

- A4 - AU Tax Invoice (INV)	Email	Melanie.Wright@ghd.com

Environmental Division
Brisbane
Work Order Reference
EB2324549

Telephone : - 61-7-3243 7222

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ALS Environmental

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☑ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle) Custody Seal Intact? Yes / No / N/A Cooling Method: Ice / Ice Pack / None Temperature:
OFFICE: Brisbane		☐ Non Standard or urgent TAT (List due date):	
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	
ORDER NUMBER:		OF: 1 2 3 4 5 6 7	
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910		
SAMPLER: MARIA PRSKALO	SAMPLER MOBILE: 0448844910	RELINQUISHED BY: M. PRSKALO	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 09/08/2023 12:00	DATE/TIME: 10/8/23 0810
Email Reports to: maria.prskalo@ghd.com		RELINQUISHED BY:	RECEIVED BY:
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com; melanie.wright@ghd.com		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	NT13 Extended Water Suite A	EA025H Suspended solids - standard level	EG020F Dissolved metals (Fe, Mn)	EG005T Total metals (Fe, Mn)	EP231X-SUT PFAS – Super Ultra Trace Full Suite (28 analytes)	EP231X-LL (TOP) PFAS – Low level TOPA (28 analytes)	EP040 Total Organo Fluorine		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MW82_PT_01	07/08/2023	W	1x500mL Green P , 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X		
2	MW82_PT_02	07/08/2023	W		9	X	X	X	X	X	X	X		
3	FD01_GW	07/08/2023	W		9	X	X	X	X	X	X	X		
4	RS01_GW	07/08/2023	W		8	X	X		X	X	X	X		
5	RS03_GW	09/08/2023	W		8	X	X		X	X	X	X		
6	RS02_GW	05/08/2023	W		3	X	X		X					
7	TB01_GW_210728	07/08/2023	W		2					X				
				TOTAL	48	6	6	3	6	6	5	5		

HT

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2324549**	Page	: 1 of 13
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 10-Aug-2023 08:10
Order number	: ----	Date Analysis Commenced	: 10-Aug-2023
C-O-C number	: ----	Issue Date	: 18-Aug-2023 16:58
Sampler	: MARIA PRSKALO		
Site	:		
Quote number	: EN/005		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X-SUT PFAS Super Ultra Trace: Samples "MW82_PT_01"(EB2324549-001), "MW82_PT_02"(EB2324549-002), & "FD01_GW"(EB2324549-003) Required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP040: Total Organic Fluorine (TOF) in waters and leachates represents the total fluorine in the organic forms which can be extracted by the SPE method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82_PT_01	MW82_PT_02	FD01_GW	RS01_GW	RS03_GW
				Sampling date / time	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	09-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324549-001	EB2324549-002	EB2324549-003	EB2324549-004	EB2324549-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.69	7.93	7.72	5.89	6.14
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		10500	10200	10200	<1	<1
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		6820	6630	6630	<1	<1
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	<5	<5	8	<5
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		3530	3570	3530	<1	<1
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		175	182	176	2	2
Total Alkalinity as CaCO3	----	1	mg/L		175	182	176	2	2
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2030	1980	2030	<1	<1
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		2640	3050	2730	<1	<1
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		513	503	519	<1	<1
Magnesium	7439-95-4	1	mg/L		547	563	542	<1	<1
Sodium	7440-23-5	1	mg/L		1060	1080	1080	<1	<1
Potassium	7440-09-7	1	mg/L		3	2	3	<1	<1
EG005(ED093)T: Total Metals by ICP-AES									
Iron	7439-89-6	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Manganese	7439-96-5	0.01	mg/L		8.40	6.85	8.12	<0.01	<0.01
EG020F: Dissolved Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		8.05	7.50	8.40	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	<0.05	<0.05	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		1.6	1.4	1.6	<0.1	<0.1
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.24	0.18	0.20	<0.01	<0.01

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82_PT_01	MW82_PT_02	FD01_GW	RS01_GW	RS03_GW
				Sampling date / time	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	09-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324549-001	EB2324549-002	EB2324549-003	EB2324549-004	EB2324549-005
					Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**120**	**131**	**123**	**0.04**	**0.04**
ø Total Cations	----	0.01	meq/L		**117**	**118**	**118**	<0.01	<0.01
ø Ionic Balance	----	0.01	%		**1.45**	**4.98**	**2.18**	**----**	**----**
EP040: Total Organic Fluorine (TOF)									
Total Organic Fluorine	----	20	µg/L		<20	<20	<20	<20	<20
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		**0.013**	**0.012**	**0.013**	<0.002	<0.002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		**0.008**	**0.007**	**0.008**	<0.002	<0.002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		**0.033**	**0.031**	**0.035**	<0.002	<0.002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		**0.019**	**0.019**	**0.023**	<0.002	<0.002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		**0.01**	**0.01**	<0.01	<0.01	<0.01
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		**0.006**	**0.006**	**0.007**	<0.002	<0.002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82_PT_01	MW82_PT_02	FD01_GW	RS01_GW	RS03_GW
				Sampling date / time	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	09-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324549-001	EB2324549-002	EB2324549-003	EB2324549-004	EB2324549-005
					Result	Result	Result	Result	Result
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		**0.089**	**0.085**	**0.086**	<0.002	<0.002

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82_PT_01	MW82_PT_02	FD01_GW	RS01_GW	RS03_GW
				Sampling date / time	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	09-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324549-001	EB2324549-002	EB2324549-003	EB2324549-004	EB2324549-005
					Result	Result	Result	Result	Result
EP231_TOP_P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		**0.052**	**0.050**	**0.058**	<0.002	<0.002
^ **Sum of TOP C4 - C14 as Fluorine**	----	0.002	µg/L		**0.055**	**0.053**	**0.053**	<0.002	<0.002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		**0.089**	**0.085**	**0.086**	<0.002	<0.002
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0141**	**0.0139**	**0.0135**	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0066**	**0.0069**	**0.0072**	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0368**	**0.0396**	**0.0376**	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0010	<0.0010	<0.0010	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0232**	**0.0223**	**0.0214**	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0081	<0.0081	<0.0080	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0040	<0.0041	<0.0040	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82_PT_01	MW82_PT_02	FD01_GW	RS01_GW	RS03_GW
				Sampling date / time	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	09-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324549-001	EB2324549-002	EB2324549-003	EB2324549-004	EB2324549-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.004	<0.004	<0.004	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.004	<0.004	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.004	<0.004	<0.004	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.002	<0.002	<0.002	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.002	<0.002	<0.002	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0600**	**0.0619**	**0.0590**	<0.0002	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0741**	**0.0758**	**0.0725**	<0.0002	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		**0.0807**	**0.0827**	**0.0797**	<0.0002	<0.0002
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**97.2**	**104**	**125**	**79.0**	**92.1**
13C8-PFOA	----	0.002	%		**101**	**98.4**	**121**	**92.6**	**92.7**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**86.5**	**93.0**	**101**	**91.8**	**86.5**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW82_PT_01	MW82_PT_02	FD01_GW	RS01_GW	RS03_GW
				Sampling date / time	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	07-Aug-2023 00:00	09-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2324549-001	EB2324549-002	EB2324549-003	EB2324549-004	EB2324549-005
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**93.7**	**98.0**	**102**	**96.5**	**93.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS02_GW	TB01_GW_210728	----	----	----
				Sampling date / time	05-Aug-2023 00:00	07-Aug-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2324549-006	EB2324549-007	--------	--------	--------
					Result	Result	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**5.69**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**1**	----	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		<1	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	----	----	----	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		<1	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**2**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**2**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		<1	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		<1	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		<1	----	----	----	----
Magnesium	7439-95-4	1	mg/L		<1	----	----	----	----
Sodium	7440-23-5	1	mg/L		<1	----	----	----	----
Potassium	7440-09-7	1	mg/L		<1	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Iron	7439-89-6	0.05	mg/L		<0.05	----	----	----	----
Manganese	7439-96-5	0.01	mg/L		<0.01	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		<0.1	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		<0.01	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS02_GW	TB01_GW_210728	----	----	----
				Sampling date / time	05-Aug-2023 00:00	07-Aug-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2324549-006	EB2324549-007	--------	--------	--------
					Result	Result	----	----	----
EK058G: Nitrate as N by Discrete Analyser - Continued									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.04**	----	----	----	----
ø Total Cations	----	0.01	meq/L		<0.01	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		----	<0.0005	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		----	<0.0005	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		----	<0.0005	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		----	<0.0005	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		----	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		----	<0.0005	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		----	<0.0020	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		----	<0.0005	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		----	<0.0005	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		----	<0.0005	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		----	<0.0005	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		----	<0.0005	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		----	<0.0005	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		----	<0.0005	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		----	<0.0005	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		----	<0.0005	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS02_GW	TB01_GW_210728	----	----	----
				Sampling date / time	05-Aug-2023 00:00	07-Aug-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2324549-006	EB2324549-007	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		----	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		----	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		----	<0.001	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		----	<0.001	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		----	<0.001	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		----	<0.001	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		----	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		----	<0.0005	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		----	<0.001	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		----	<0.001	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		----	<0.001	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		----	<0.001	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		----	<0.0002	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		----	<0.0002	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		----	<0.0002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		----	**93.2**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS02_GW	TB01_GW_210728	----	----	----
				Sampling date / time	05-Aug-2023 00:00	07-Aug-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2324549-006	EB2324549-007	--------	--------	--------
					Result	Result	----	----	----
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**----**	**97.4**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	34	137
13C8-PFOA	----	56	129
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2324549**	Page	: 1 of 12
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 10-Aug-2023
Order number	: ----	Date Analysis Commenced	: 10-Aug-2023
C-O-C number	: ----	Issue Date	: 18-Aug-2023
Sampler	: MARIA PRSKALO		
Site	:		
Quote number	: EN/005		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5232081)									
EB2324549-001	MW82_PT_01	EG005T: Manganese	7439-96-5	0.01	mg/L	8.40	8.19	2.5	0% - 20%
		EG005T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EP040: Total Organic Fluorine (TOF) (QC Lot: 5226985)									
EB2324549-001	MW82_PT_01	EP040: Total Organic Fluorine	----	20	µg/L	<20	<20	0.0	No Limit
EA005P: pH by PC Titrator (QC Lot: 5227734)									
EB2324225-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	4.33	4.34	0.2	0% - 20%
EB2324392-018	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.60	7.61	0.1	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5227736)									
EB2324549-004	RS01_GW	EA005-P: pH Value	----	0.01	pH Unit	5.89	5.91	0.3	0% - 20%
EB2324535-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.26	8.26	0.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5227732)									
EB2324225-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	7150	7180	0.5	0% - 20%
EB2324392-018	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	317	316	0.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5227738)									
EB2324549-004	RS01_GW	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	<1	0.0	No Limit
EB2324535-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	762	759	0.4	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5229705)									
EB2324455-010	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	54	52	3.8	0% - 50%
EB2324549-004	RS01_GW	EA025H: Suspended Solids (SS)	----	5	mg/L	8	6	29.6	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5227733)									
EB2324225-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5227733) - continued									
EB2324225-002	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.0	No Limit
EB2324392-018	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	69	68	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	69	68	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5227737)									
EB2324549-004	RS01_GW	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	2	2	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	2	2	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5229210)									
EB2324539-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	46	47	0.0	0% - 20%
EB2324549-006	RS02_GW	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 5229208)									
EB2324539-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3690	3830	3.7	0% - 20%
EB2324549-006	RS02_GW	ED045G: Chloride	16887-00-6	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5230840)									
EB2324405-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	8	8	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	120	119	1.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	632	632	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EB2324683-012	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	255	256	0.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	387	382	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1420	1390	2.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	12	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 5232063)									
EB2323074-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	6	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	22	22	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EB2324210-017	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 5232064)									
EB2324549-006	RS02_GW	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5232064) - continued									
EB2324549-006	RS02_GW	ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EB2324725-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	16	16	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	8	8	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	129	130	1.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	17	16	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 5232173)									
EB2324646-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	420	405	3.5	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1240	1200	2.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	7820	7710	1.4	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	267	257	3.7	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5230838)									
EB2324405-001	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.502	0.503	0.2	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.31	0.31	0.0	No Limit
EB2324683-012	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	24 µg/L	0.024	0.0	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	380 µg/L	0.38	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5232174)									
EB2324657-007	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	8.48	9.05	6.5	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	52.3	56.1	7.0	0% - 20%
EB2324646-004	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	6.72	6.48	3.7	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5227735)									
EB2324225-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
EB2324392-018	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5227739)									
EB2324549-004	RS01_GW	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5229594)									
EB2324535-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.13	0.13	0.0	0% - 50%
EB2324549-006	RS02_GW	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5229209)									
EB2324539-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2324549-006	RS02_GW	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5229590)									
EB2324535-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2324549-006	RS02_GW	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5229211)									
EB2324539-003	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.06	0.07	22.1	No Limit
EB2324549-006	RS02_GW	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5229574)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5229574) - continued									
EB2324549-003	FD01_GW	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	0.013	0.014	0.0	No Limit
		EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	0.008	0.007	0.0	No Limit
		EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	0.035	0.033	4.0	0% - 50%
		EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	0.023	0.018	22.4	0% - 50%
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	<0.002	0.0	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5229574)									
EB2324549-003	FD01_GW	EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	0.007	0.006	0.0	No Limit
		EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 5229574)									
EB2324549-003	FD01_GW	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	<0.005	0.0	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5229574)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5229574) - continued									
EB2324549-003	FD01_GW	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	<0.005	0.0	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 5229574)									
EB2324549-003	FD01_GW	EP231X-LL: Sum of PFAS	----	0.002	µg/L	0.086	0.078	9.8	0% - 20%
		EP231X-LL: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L	0.058	0.051	12.8	0% - 20%
		EP231X-LL: Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L	0.053	0.048	10.2	0% - 20%
		EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	0.086	0.078	9.8	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5232081)								
EG005T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.9	70.0	130
EG005T: Manganese	7439-96-5	0.01	mg/L	<0.01	0.1 mg/L	93.0	82.0	122
EP040: Total Organic Fluorine (TOF) (QCLot: 5226985)								
EP040: Total Organic Fluorine	----	20	µg/L	<20	477 µg/L	93.8	70.0	120
EA005P: pH by PC Titrator (QCLot: 5227734)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.7	98.0	102
EA005P: pH by PC Titrator (QCLot: 5227736)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5227732)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	99.1	90.0	106
				<1	12890 µS/cm	96.3	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5227738)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	101	90.0	106
				<1	24800 µS/cm	103	90.0	106
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5229705)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	93.9	88.0	112
				<5	1000 mg/L	103	88.0	112
				<5	926 mg/L	94.9	84.8	116
ED037P: Alkalinity by PC Titrator (QCLot: 5227733)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	101	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5227737)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	89.1	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5229210)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	96.7	85.0	118
				<1	100 mg/L	95.9	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 5229208)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	101	90.0	115
				<1	1000 mg/L	103	90.0	115
ED093F: Dissolved Major Cations (QCLot: 5230840)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED093F: Dissolved Major Cations (QCLot: 5230840) - continued								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	113	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	98.8	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5232063)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	111	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	106	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.8	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.6	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5232064)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	111	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	108	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.8	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.0	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5232173)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	112	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	104	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	102	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 5230838)								
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.3	89.0	120
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.8	82.0	114
EG020F: Dissolved Metals by ICP-MS (QCLot: 5232174)								
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	100	89.0	120
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	99.6	82.0	114
EK040P: Fluoride by PC Titrator (QCLot: 5227735)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	101	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5227739)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	97.6	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5229594)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	114	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5229209)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	95.8	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5229590)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5229590) - continued								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	93.0	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5229211)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.9	81.7	117
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5229574)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.475 µg/L	71.1	44.9	136
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.465 µg/L	74.5	33.2	116
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5229574)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	----	----	----	----
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.5 µg/L	78.6	47.0	123
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5229574)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5229574)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5229574) - continued								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.0476 µg/L	1.0	0	200
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_P: PFAS Sums (QCLot: 5229574)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5226996)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	104	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	106	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	103	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	104	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	107	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	92.7	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5226996)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	102	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	111	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	111	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	110	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	105	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	110	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	119	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	104	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	108	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	123	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5226996)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	108	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	112	68.0	141

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5226996) - continued								
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	113	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	118	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	113	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	104	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	131	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5226996)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	112	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	116	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	120	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	116	53.1	133
EP231P: PFAS Sums (QCLot: 5226996)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5232081)							
EB2324549-002	MW82_PT_02	EG005T: Manganese	7439-96-5	1 mg/L	# Not Determined	70.0	130
EP040: Total Organic Fluorine (TOF) (QCLot: 5226985)							
EB2324549-002	MW82_PT_02	EP040: Total Organic Fluorine	----	477 µg/L	94.4	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5229210)							
EB2324509-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	96.0	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5229208)							
EB2324509-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	114	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020F: Dissolved Metals by ICP-MS (QCLot: 5230838)							
EB2324405-002	Anonymous	EG020A-F: Manganese	7439-96-5	1 mg/L	95.7	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 5232174)							
EB2324646-004	Anonymous	EG020A-F: Manganese	7439-96-5	5 mg/L	95.2	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5227735)							
ET2303316-003	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	87.4	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5227739)							
EB2324549-005	RS03_GW	EK040P: Fluoride	16984-48-8	5 mg/L	93.8	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5229594)							
EB2324549-003	FD01_GW	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	127	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5229209)							
EB2324509-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	101	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5229590)							
EB2324549-003	FD01_GW	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	92.2	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5229211)							
EB2324509-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	101	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2324549**	Page	: 1 of 13
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 10-Aug-2023
Site	:	Issue Date	: 18-Aug-2023
Sampler	: MARIA PRSKALO	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG005(ED093)T: Total Metals by ICP-AES	EB2324549--002	MW82_PT_02	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
RS02_GW	----	----	----	10-Aug-2023	05-Aug-2023	**5**
Clear Plastic Bottle - Natural						
MW82_PT_02, RS01_GW	----	----	----	10-Aug-2023	07-Aug-2023	**3**
Clear Plastic Bottle - Natural						
MW82_PT_01, FD01_GW	----	----	----	14-Aug-2023	07-Aug-2023	**7**
Clear Plastic Bottle - Natural						
RS03_GW	----	----	----	10-Aug-2023	09-Aug-2023	**1**
EA065: Total Hardness as CaCO3						
Clear Plastic Bottle - Natural						
RS02_GW	----	----	----	16-Aug-2023	12-Aug-2023	**4**
Clear Plastic Bottle - Natural						
RS01_GW	----	----	----	16-Aug-2023	14-Aug-2023	**2**
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
RS02_GW	----	----	----	16-Aug-2023	12-Aug-2023	**4**
Clear Plastic Bottle - Natural						
RS01_GW	----	----	----	16-Aug-2023	14-Aug-2023	**2**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
RS02_GW	----	----	----	11-Aug-2023	07-Aug-2023	**4**
Clear Plastic Bottle - Natural						
MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	----	----	----	11-Aug-2023	09-Aug-2023	**2**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
RS02_GW	----	----	----	11-Aug-2023	07-Aug-2023	**4**
Clear Plastic Bottle - Natural						
MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	----	----	----	11-Aug-2023	09-Aug-2023	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) RS02_GW	**05-Aug-2023**	**----**	----	----	**10-Aug-2023**	05-Aug-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW82_PT_02, RS01_GW	**07-Aug-2023**	**----**	----	----	**10-Aug-2023**	07-Aug-2023	×
Clear Plastic Bottle - Natural (EA005-P) MW82_PT_01, FD01_GW	**07-Aug-2023**	**----**	----	----	**14-Aug-2023**	07-Aug-2023	×
Clear Plastic Bottle - Natural (EA005-P) RS03_GW	**09-Aug-2023**	**----**	----	----	**10-Aug-2023**	09-Aug-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) RS02_GW	**05-Aug-2023**	**----**	----	----	**10-Aug-2023**	02-Sep-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW82_PT_02, RS01_GW	**07-Aug-2023**	**----**	----	----	**10-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Natural (EA010-P) MW82_PT_01, FD01_GW	**07-Aug-2023**	**----**	----	----	**14-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Natural (EA010-P) RS03_GW	**09-Aug-2023**	**----**	----	----	**10-Aug-2023**	06-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) RS02_GW	**05-Aug-2023**	----	----	----	**11-Aug-2023**	12-Aug-2023	✓
Clear Plastic Bottle - Natural (EA025H) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	----	----	----	**11-Aug-2023**	14-Aug-2023	✓
Clear Plastic Bottle - Natural (EA025H) RS03_GW	**09-Aug-2023**	----	----	----	**11-Aug-2023**	16-Aug-2023	✓
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) MW82_PT_01, MW82_PT_02	**07-Aug-2023**	----	----	----	**13-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) FD01_GW	**07-Aug-2023**	----	----	----	**16-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Natural (ED093F) RS02_GW	**05-Aug-2023**	----	----	----	**16-Aug-2023**	12-Aug-2023	×
Clear Plastic Bottle - Natural (ED093F) RS01_GW	**07-Aug-2023**	----	----	----	**16-Aug-2023**	14-Aug-2023	×
Clear Plastic Bottle - Natural (ED093F) RS03_GW	**09-Aug-2023**	----	----	----	**16-Aug-2023**	16-Aug-2023	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) RS02_GW	**05-Aug-2023**	----	----	----	**10-Aug-2023**	19-Aug-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW82_PT_02, RS01_GW	**07-Aug-2023**	----	----	----	**10-Aug-2023**	21-Aug-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW82_PT_01, FD01_GW	**07-Aug-2023**	----	----	----	**14-Aug-2023**	21-Aug-2023	✓
Clear Plastic Bottle - Natural (ED037-P) RS03_GW	**09-Aug-2023**	----	----	----	**10-Aug-2023**	23-Aug-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) RS02_GW	**05-Aug-2023**	----	----	----	**11-Aug-2023**	02-Sep-2023	✓
Clear Plastic Bottle - Natural (ED041G) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	----	----	----	**11-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Natural (ED041G) RS03_GW	**09-Aug-2023**	----	----	----	**11-Aug-2023**	06-Sep-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) RS02_GW	**05-Aug-2023**	----	----	----	**11-Aug-2023**	02-Sep-2023	✓
Clear Plastic Bottle - Natural (ED045G) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	----	----	----	**11-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Natural (ED045G) RS03_GW	**09-Aug-2023**	----	----	----	**11-Aug-2023**	06-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) MW82_PT_01, MW82_PT_02	**07-Aug-2023**	**----**	----	----	**13-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) FD01_GW	**07-Aug-2023**	**----**	----	----	**16-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Natural (ED093F) RS02_GW	**05-Aug-2023**	**----**	----	----	**16-Aug-2023**	12-Aug-2023	×
Clear Plastic Bottle - Natural (ED093F) RS01_GW	**07-Aug-2023**	**----**	----	----	**16-Aug-2023**	14-Aug-2023	×
Clear Plastic Bottle - Natural (ED093F) RS03_GW	**09-Aug-2023**	**----**	----	----	**16-Aug-2023**	16-Aug-2023	✓
EG005(ED093)T: Total Metals by ICP-AES							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG005T) RS02_GW	**05-Aug-2023**	**14-Aug-2023**	01-Feb-2024	✓	**15-Aug-2023**	01-Feb-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG005T) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**14-Aug-2023**	03-Feb-2024	✓	**15-Aug-2023**	03-Feb-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG005T) RS03_GW	**09-Aug-2023**	**14-Aug-2023**	05-Feb-2024	✓	**15-Aug-2023**	05-Feb-2024	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) MW82_PT_01, MW82_PT_02	**07-Aug-2023**	**----**	----	----	**13-Aug-2023**	03-Feb-2024	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) FD01_GW	**07-Aug-2023**	**----**	----	----	**16-Aug-2023**	03-Feb-2024	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P) RS02_GW	**05-Aug-2023**	**----**	----	----	**10-Aug-2023**	02-Sep-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW82_PT_02, RS01_GW	**07-Aug-2023**	**----**	----	----	**10-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Natural (EK040P) MW82_PT_01, FD01_GW	**07-Aug-2023**	**----**	----	----	**14-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Natural (EK040P) RS03_GW	**09-Aug-2023**	**----**	----	----	**10-Aug-2023**	06-Sep-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) RS02_GW	**05-Aug-2023**	**----**	----	----	**11-Aug-2023**	02-Sep-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**----**	----	----	**11-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) RS03_GW	**09-Aug-2023**	**----**	----	----	**11-Aug-2023**	06-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) RS02_GW	**05-Aug-2023**	**----**	----	----	**11-Aug-2023**	07-Aug-2023	×
Clear Plastic Bottle - Natural (EK057G) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**----**	----	----	**11-Aug-2023**	09-Aug-2023	×
Clear Plastic Bottle - Natural (EK057G) RS03_GW	**09-Aug-2023**	**----**	----	----	**11-Aug-2023**	11-Aug-2023	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) RS02_GW	**05-Aug-2023**	**----**	----	----	**11-Aug-2023**	02-Sep-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**----**	----	----	**11-Aug-2023**	04-Sep-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) RS03_GW	**09-Aug-2023**	**----**	----	----	**11-Aug-2023**	06-Sep-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) RS02_GW	**05-Aug-2023**	**----**	----	----	**11-Aug-2023**	07-Aug-2023	×
Clear Plastic Bottle - Natural (EK071G) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**----**	----	----	**11-Aug-2023**	09-Aug-2023	×
Clear Plastic Bottle - Natural (EK071G) RS03_GW	**09-Aug-2023**	**----**	----	----	**11-Aug-2023**	11-Aug-2023	✓
EP040: Total Organic Fluorine (TOF)							
HDPE (no PTFE) (EP040) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**10-Aug-2023**	04-Sep-2023	✓	**11-Aug-2023**	04-Sep-2023	✓
HDPE (no PTFE) (EP040) RS03_GW	**09-Aug-2023**	**10-Aug-2023**	06-Sep-2023	✓	**11-Aug-2023**	06-Sep-2023	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**11-Aug-2023**	03-Feb-2024	✓	**13-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS03_GW	**09-Aug-2023**	**11-Aug-2023**	05-Feb-2024	✓	**13-Aug-2023**	05-Feb-2024	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**11-Aug-2023**	03-Feb-2024	✓	**13-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS03_GW	**09-Aug-2023**	**11-Aug-2023**	05-Feb-2024	✓	**13-Aug-2023**	05-Feb-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL (TOP)) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**11-Aug-2023**	03-Feb-2024	✓	**13-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS03_GW	**09-Aug-2023**	**11-Aug-2023**	05-Feb-2024	✓	**13-Aug-2023**	05-Feb-2024	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**11-Aug-2023**	03-Feb-2024	✓	**13-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS03_GW	**09-Aug-2023**	**11-Aug-2023**	05-Feb-2024	✓	**13-Aug-2023**	05-Feb-2024	✓
EP231_TOP_P: PFAS Sums							
HDPE (no PTFE) (EP231X-LL (TOP)) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW	**07-Aug-2023**	**11-Aug-2023**	03-Feb-2024	✓	**13-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS03_GW	**09-Aug-2023**	**11-Aug-2023**	05-Feb-2024	✓	**13-Aug-2023**	05-Feb-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW, TB01_GW_210728	**07-Aug-2023**	**11-Aug-2023**	03-Feb-2024	✓	**15-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS03_GW	**09-Aug-2023**	**11-Aug-2023**	05-Feb-2024	✓	**15-Aug-2023**	05-Feb-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW, TB01_GW_210728	**07-Aug-2023**	**11-Aug-2023**	03-Feb-2024	✓	**15-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS03_GW	**09-Aug-2023**	**11-Aug-2023**	05-Feb-2024	✓	**15-Aug-2023**	05-Feb-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW, TB01_GW_210728	**07-Aug-2023**	**11-Aug-2023**	03-Feb-2024	✓	**15-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS03_GW	**09-Aug-2023**	**11-Aug-2023**	05-Feb-2024	✓	**15-Aug-2023**	05-Feb-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW, TB01_GW_210728	**07-Aug-2023**	**11-Aug-2023**	03-Feb-2024	✓	**15-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS03_GW	**09-Aug-2023**	**11-Aug-2023**	05-Feb-2024	✓	**15-Aug-2023**	05-Feb-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) MW82_PT_01, MW82_PT_02, FD01_GW, RS01_GW, TB01_GW_210728	**07-Aug-2023**	**11-Aug-2023**	03-Feb-2024	✓	**15-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS03_GW	**09-Aug-2023**	**11-Aug-2023**	05-Feb-2024	✓	**15-Aug-2023**	05-Feb-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	20	**15.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	7	37	**18.92**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	6	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	37	**10.81**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	16	**18.75**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	37	**10.81**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	20	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	6	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Total Recoverable Metals by ICP-AES	EG005T	WATER	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Samples are digested by USEPA 3005 prior to analysis. The ICPAES technique ionises the sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM Schedule B(3).
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Total Organic Fluorine (TOF)	EP040	WATER	In house: Fluorinated organic compounds are isolated from the sample by adsorption onto activated carbon. Hydropyrolytic combustion of the SPE extract converts organic forms of fluorine to hydrogen fluoride (HF). The HF is adsorbed in a trapping solution and the total fluoride concentration determined by Ion Chromatography (IC).
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349. Sample extracts are analysed by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Total Organic Fluorine Preparation - Waters	EP040-PR	WATER	In house - Fluorinated organic compounds are isolated by Solid Phase Extraction (SPE). Inorganic fluorine is displaced by washing with water and organic forms eluted with Methanol.

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Precuror Digest for PFAS - Low Level	* ORG70-SPE	WATER	In-House SPE followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349: A 50 mL sample is concentrated by SPE, taken to near dryness and made up to 5 mL in a reagent solution. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2325013**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: maria.prskalo@ghd.com	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 3316 3333	Facsimile	: +61-7-3243 7218
Project	: 12609270	Page	: 1 of 3
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/005)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: MARIA PRSKALO		

Dates

Date Samples Received	: 15-Aug-2023 08:10	Issue Date	: 15-Aug-2023
Client Requested Due Date	: 23-Aug-2023	Scheduled Reporting Date	: **23-Aug-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: -0.1°C - Ice present
Receipt Detail	: MEDIUM HARD ESKY	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EA025H Suspended Solids - Standard Level	WATER - EG005T Total Metals by ICPAES (including digestion)	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EP040 Total Organic Fluorine (TOF)	WATER - EP231X-LL (TOP) PFAS - Total Oxidisable Precursor (TOP) Assay -	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-13 Extended Water Suite A
EB2325013-001	10-Aug-2023 00:00	MW90_PT_01	✓	✓	✓	✓	✓	✓	✓
EB2325013-002	10-Aug-2023 00:00	MW90_PT_02	✓	✓	✓	✓	✓	✓	✓
EB2325013-003	11-Aug-2023 00:00	RS04_GW	✓	✓		✓	✓	✓	✓
EB2325013-004	07-Aug-2023 00:00	FB01_GW						✓	
EB2325013-005	10-Aug-2023 00:00	FB02_GW						✓	
EB2325013-006	10-Aug-2023 00:00	TB02_GW_210702						✓	

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA005-P: pH by Auto Titrator							
MW90_PT_01	Clear Plastic Bottle - Natural	----	10-Aug-2023	15-Aug-2023	×	----	----
MW90_PT_02	Clear Plastic Bottle - Natural	----	10-Aug-2023	15-Aug-2023	×	----	----
RS04_GW	Clear Plastic Bottle - Natural	----	11-Aug-2023	15-Aug-2023	×	----	----
EK057G: Nitrite as N by Discrete Analyser							
MW90_PT_01	Clear Plastic Bottle - Natural	----	12-Aug-2023	15-Aug-2023	×	----	----
MW90_PT_02	Clear Plastic Bottle - Natural	----	12-Aug-2023	15-Aug-2023	×	----	----
RS04_GW	Clear Plastic Bottle - Natural	----	13-Aug-2023	15-Aug-2023	×	----	----
EK071G: Reactive Phosphorus as P-By Discrete Analyser							
MW90_PT_01	Clear Plastic Bottle - Natural	----	12-Aug-2023	15-Aug-2023	×	----	----
MW90_PT_02	Clear Plastic Bottle - Natural	----	12-Aug-2023	15-Aug-2023	×	----	----
RS04_GW	Clear Plastic Bottle - Natural	----	13-Aug-2023	15-Aug-2023	×	----	----

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

MARIA PRSKALO

- *AU Certificate of Analysis - NATA (COA)	Email	maria.prskalo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	maria.prskalo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	maria.prskalo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	maria.prskalo@ghd.com
- A4 - AU Tax Invoice (INV)	Email	maria.prskalo@ghd.com
- Chain of Custody (CoC) (COC)	Email	maria.prskalo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	maria.prskalo@ghd.com
- EDI Format - XTab (XTAB)	Email	maria.prskalo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	maria.prskalo@ghd.com

MELANIE WRIGHT

- *AU Certificate of Analysis - NATA (COA)	Email	Melanie.Wright@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	Melanie.Wright@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	Melanie.Wright@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	Melanie.Wright@ghd.com
- Chain of Custody (CoC) (COC)	Email	Melanie.Wright@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	Melanie.Wright@ghd.com
- EDI Format - XTab (XTAB)	Email	Melanie.Wright@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	Melanie.Wright@ghd.com

Environmental Division
Brisbane
Work Order Reference
EB2325013

Telephone : + 61-7-3243 7222

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
TOWNS Ph: 07 47
WOLLO Ph: 02 42
ISY Ph: (

CLIENT: GHD	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☑ Standard TAT (List due date):	FOR LABORATORY U
OFFICE: Brisbane		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Cooling Method: Ice Ice Bricks Gel Ice Bricks None Cooling Initiated
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Other Comments:
ORDER NUMBER:			
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910		
SAMPLER: MARIA PRSKALO	SAMPLER MOBILE: 0448 844 910		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):		
Email Reports to: maria.prskalo@ghd.com; melanie.wright@ghd.com			
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
M. PRSKALO			
DATE/TIME: 14/08/2023	DATE/TIME: 15/8/23 8:10	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	NT13 Extended Water Suite A	EA025H Suspended solids - standard level	EG020F Dissolved metals (Fe, Mn)	EG005T Total metals (Fe, Mn)	EP231X-SUT PFAS – Super Ultra Trace Full Suite (28 analytes)	EP231X-LL (TOP) PFAS – Low level TOPA (28 analytes)	EP040 Total Organo Fluorine		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MW90_PT_01	10/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X		
2	MW90_PT_02	10/08/2023	W		9	X	X	X	X	X	X	X		
3	RS04_GW	11/08/2023	W		8	X	X		X	X	X	X		
4	FB01_GW	07/08/2023	W		2					X				
5	FB02_GW	10/08/2023	W		2					X				
6	TB02_GW_210702	10/08/2023	W		2					X				
				TOTAL										

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2325013**	Page	: 1 of 11
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 15-Aug-2023 08:10
Order number	: ----	Date Analysis Commenced	: 15-Aug-2023
C-O-C number	: ----	Issue Date	: 22-Aug-2023 17:30
Sampler	: MARIA PRSKALO		
Site	:		
Quote number	: EN/005		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EK055G (Ammonia as N): Sample EB2325013-003 (RS04_GW) was diluted due to matrix interference. LOR adjusted accordingly.
- EP231X-SUT PFAS Super Ultra Trace: The high recovery laboratory control standard for 10:2 FTS is deemed acceptable as associated results are less than the limit of reporting.
- EP231X-SUT PFAS Super Ultra Trace: The high recovery matrix spike for 10:2 FTS is deemed acceptable as associated results are less than the limit of reporting.
- EP231X-SUT PFAS Super Ultra Trace: The LORs of particular analytes for particular samples have been raised due to sample matrix interferences (Internal Standard Suppression). The LORs of particular analytes have been raised further due to additional matrix interferences.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP040: Total Organic Fluorine (TOF) in waters and leachates represents the total fluorine in the organic forms which can be extracted by the SPE method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW90_PT_01	MW90_PT_02	RS04_GW	FB01_GW	FB02_GW
			Sampling date / time	10-Aug-2023 00:00	10-Aug-2023 00:00	11-Aug-2023 00:00	07-Aug-2023 00:00	10-Aug-2023 00:00
Compound	CAS Number	LOR	Unit	EB2325013-001	EB2325013-002	EB2325013-003	EB2325013-004	EB2325013-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.94**	**7.90**	**6.13**	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**9430**	**9120**	**3**	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	**6130**	**5930**	**2**	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	<5	<5	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**3250**	**3340**	<1	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**365**	**350**	**3**	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**365**	**350**	**3**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**1420**	**1430**	<1	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**1990**	**1940**	<1	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**327**	**333**	<1	----	----
Magnesium	7439-95-4	1	mg/L	**592**	**610**	<1	----	----
Sodium	7440-23-5	1	mg/L	**827**	**808**	<1	----	----
Potassium	7440-09-7	1	mg/L	<1	<1	<1	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	**0.06**	----	----
Manganese	7439-96-5	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EG020F: Dissolved Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	**0.022**	**0.028**	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.5**	**0.5**	<0.1	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.02**	**0.02**	<0.05	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90_PT_01	MW90_PT_02	RS04_GW	FB01_GW	FB02_GW
				Sampling date / time	10-Aug-2023 00:00	10-Aug-2023 00:00	11-Aug-2023 00:00	07-Aug-2023 00:00	10-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325013-001	EB2325013-002	EB2325013-003	EB2325013-004	EB2325013-005
					Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**93.0**	**91.5**	**0.06**	----	----
ø Total Cations	----	0.01	meq/L		**101**	**102**	<0.01	----	----
ø Ionic Balance	----	0.01	%		**4.13**	**5.42**	----	----	----
EP040: Total Organic Fluorine (TOF)									
Total Organic Fluorine	----	20	µg/L		<20	<20	<20	----	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		**0.020**	**0.020**	<0.002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		**0.017**	**0.018**	<0.002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		**0.107**	**0.106**	<0.002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		**0.005**	**0.004**	<0.002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		**0.067**	**0.063**	<0.002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.002	<0.002	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		**0.005**	**0.005**	<0.002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.002	<0.002	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90_PT_01	MW90_PT_02	RS04_GW	FB01_GW	FB02_GW
				Sampling date / time	10-Aug-2023 00:00	10-Aug-2023 00:00	11-Aug-2023 00:00	07-Aug-2023 00:00	10-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325013-001	EB2325013-002	EB2325013-003	EB2325013-004	EB2325013-005
					Result	Result	Result	Result	Result
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.005	<0.005	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.002	<0.002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.002	<0.002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.002	<0.002	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	<0.005	<0.005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	<0.005	<0.005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	<0.005	<0.005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	<0.005	<0.005	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		**0.221**	**0.216**	<0.002	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90_PT_01	MW90_PT_02	RS04_GW	FB01_GW	FB02_GW
				Sampling date / time	10-Aug-2023 00:00	10-Aug-2023 00:00	11-Aug-2023 00:00	07-Aug-2023 00:00	10-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325013-001	EB2325013-002	EB2325013-003	EB2325013-004	EB2325013-005
					Result	Result	Result	Result	Result
EP231_TOP_P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		**0.174**	**0.169**	<0.002	----	----
^ **Sum of TOP C4 - C14 as Fluorine**	----	0.002	µg/L		**0.137**	**0.134**	<0.002	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		**0.221**	**0.216**	<0.002	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**0.0220**	**0.0238**	<0.0005	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0128**	**0.0135**	<0.0005	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.118**	**0.118**	<0.0005	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0045**	**0.0046**	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0667**	**0.0684**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0079	<0.0078	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0016	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0006	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90_PT_01	MW90_PT_02	RS04_GW	FB01_GW	FB02_GW
				Sampling date / time	10-Aug-2023 00:00	10-Aug-2023 00:00	11-Aug-2023 00:00	07-Aug-2023 00:00	10-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325013-001	EB2325013-002	EB2325013-003	EB2325013-004	EB2325013-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.185**	**0.186**	<0.0002	<0.0002	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.207**	**0.210**	<0.0002	<0.0002	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		**0.224**	**0.228**	<0.0002	<0.0002	<0.0002
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**136**	**127**	**131**	**----**	**----**
13C8-PFOA	----	0.002	%		**128**	**122**	**120**	**----**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**104**	**95.9**	**107**	**103**	**108**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW90_PT_01	MW90_PT_02	RS04_GW	FB01_GW	FB02_GW
				Sampling date / time	10-Aug-2023 00:00	10-Aug-2023 00:00	11-Aug-2023 00:00	07-Aug-2023 00:00	10-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325013-001	EB2325013-002	EB2325013-003	EB2325013-004	EB2325013-005
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**108**	**110**	**106**	**109**	**107**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TB02_GW_210702	----	----	----	----
				Sampling date / time	10-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2325013-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	TB02_GW_210702	----	----	----	----
				Sampling date / time	10-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2325013-006	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	----	----	----	----
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		<0.0002	----	----	----	----
^ **Sum of PFAS**	----	0.0002	µg/L		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**101**	----	----	----	----
13C8-PFOA	----	0.0005	%		**99.7**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	34	137
13C8-PFOA	----	56	129
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2325013**	Page	: 1 of 13
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 15-Aug-2023
Order number	: ----	Date Analysis Commenced	: 15-Aug-2023
C-O-C number	: ----	Issue Date	: 22-Aug-2023
Sampler	: MARIA PRSKALO		
Site	:		
Quote number	: EN/005		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5242745)									
EB2325013-001	MW90_PT_01	EG005T: Manganese	7439-96-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG005T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2325216-008	Anonymous	EG005T: Manganese	7439-96-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG005T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EP040: Total Organic Fluorine (TOF) (QC Lot: 5241515)									
EB2325013-001	MW90_PT_01	EP040: Total Organic Fluorine	----	20	µg/L	<20	<20	0.0	No Limit
EB2325216-008	Anonymous	EP040: Total Organic Fluorine	----	20	µg/L	30	30	0.0	No Limit
EA005P: pH by PC Titrator (QC Lot: 5236087)									
EB2324850-004	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.45	8.44	0.1	0% - 20%
EB2320202-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	12.3	12.3	0.2	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5236402)									
EB2325015-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.43	7.47	0.5	0% - 20%
EB2323105-005	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.05	8.11	0.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5236088)									
EB2324850-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	12400	12600	1.7	0% - 20%
EB2320202-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	12100	12000	1.2	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5236400)									
EB2325015-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	138	139	0.0	0% - 20%
EB2323105-005	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	467	468	0.0	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5239579)									
EB2324771-004	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	42	48	14.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5236089)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5236089) - continued									
EB2324850-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	25	27	5.1	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	540	540	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	566	567	0.2	0% - 20%
EB2320202-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	1500	1370	9.1	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	340	385	12.5	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1840	1760	4.7	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5236401)									
EB2325015-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	43	41	3.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	43	41	3.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5240993)									
EB2324976-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
EB2323869-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5240994)									
EB2325001-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	40	41	0.0	0% - 20%
EB2324020-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	13	13	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 5240990)									
EB2324976-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	81	75	7.7	0% - 20%
EB2323869-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	3150	3160	0.3	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5240991)									
EB2325001-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	340	346	1.8	0% - 20%
EB2324020-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	23	23	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5241770)									
EB2325045-008	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	3	3	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	8	8	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	98	95	2.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EB2325126-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	54	53	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	7	7	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	1	1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	16	16	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 5242739)									
EB2324827-002	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	1	1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	62	58	6.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 5242739) - continued									
EB2324825-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	20	20	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	6	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	2	2	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5241772)									
EB2325045-008	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.018	0.017	0.0	0% - 50%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	12.0	11.6	2.8	0% - 20%
EB2325126-002	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	2.86	2.88	0.6	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.42	0.42	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5236090)									
EB2324850-004	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.4	1.4	0.0	0% - 50%
EB2320202-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.1	1.1	0.0	0% - 50%
EK040P: Fluoride by PC Titrator (QC Lot: 5236399)									
EB2325015-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5240504)									
EB2325061-004	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5240996)									
EB2324976-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2323869-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5240997)									
EB2325001-005	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2324020-008	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.04	0.04	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5240500)									
EB2325061-004	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.04	0.04	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5240999)									
EB2324976-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5241000)									
EB2325001-005	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.42	0.42	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5236671)									
EB2325036-001	Anonymous	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0003	<0.0003	0.0	No Limit
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5236671) - continued									
EB2325036-001	Anonymous	EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0007	<0.0007	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5236671)									
EB2325036-001	Anonymous	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0016	<0.0016	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0080	<0.0080	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5236671)									
EB2325036-001	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5236671)									
EB2325036-001	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5236671) - continued									
EB2325036-001	Anonymous	EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5242745)								
EG005T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	111	70.0	130
EG005T: Manganese	7439-96-5	0.01	mg/L	<0.01	0.1 mg/L	100	82.0	122
EP040: Total Organic Fluorine (TOF) (QCLot: 5241515)								
EP040: Total Organic Fluorine	----	20	µg/L	<20	477 µg/L	86.6	70.0	120
EA005P: pH by PC Titrator (QCLot: 5236087)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.7	98.0	102
EA005P: pH by PC Titrator (QCLot: 5236402)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	101	98.0	102
				----	7 pH Unit	99.7	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5236088)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	96.1	90.0	106
				<1	24800 µS/cm	98.2	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5236400)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	97.7	90.0	106
				<1	12890 µS/cm	95.6	90.0	106
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5239579)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	102	88.0	112
				<5	1000 mg/L	96.2	88.0	112
				<5	926 mg/L	98.2	84.8	116
ED037P: Alkalinity by PC Titrator (QCLot: 5236089)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	99.4	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5236401)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	93.1	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5240993)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.8	85.0	118
				<1	100 mg/L	98.6	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5240994)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.0	85.0	118
				<1	100 mg/L	95.8	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 5240990)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED045G: Chloride by Discrete Analyser (QCLot: 5240990) - continued								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	95.8	90.0	115
				<1	1000 mg/L	96.0	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5240991)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	91.2	90.0	115
				<1	1000 mg/L	96.4	90.0	115
ED093F: Dissolved Major Cations (QCLot: 5241770)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	110	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	107	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	105	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	101	70.0	130
ED093F: Dissolved Major Cations (QCLot: 5242739)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	106	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	111	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	109	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	110	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 5241772)								
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.1	89.0	120
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.9	82.0	114
EK040P: Fluoride by PC Titrator (QCLot: 5236090)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	98.7	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5236399)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	10 mg/L	95.5	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5240504)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	89.3	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5240996)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	98.5	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5240997)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	98.4	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5240500)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	93.8	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5240999)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	98.3	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5241000)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.8	81.7	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5236673)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.475 µg/L	108	44.9	136
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.465 µg/L	64.7	33.2	116
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5236673)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	----	----	----	----
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.5 µg/L	102	47.0	123
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5236673)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5236673)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.0476 µg/L	-0.2	0	200
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231_TOP_P: PFAS Sums (QCLot: 5236673)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5236671)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	110	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	95.3	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	90.8	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	88.2	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	99.6	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	88.9	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5236671)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	103	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	91.2	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	99.6	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	91.2	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	90.4	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	92.0	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	90.4	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	102	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	104	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	102	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5236671)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	102	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	118	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	87.5	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	93.3	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	91.0	60.0	136

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5236671) - continued								
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	93.6	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	79.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5236671)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	97.1	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	115	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	107	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	# 166	53.1	133
EP231P: PFAS Sums (QCLot: 5236671)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5242745)							
EB2325013-002	MW90_PT_02	EG005T: Manganese	7439-96-5	1 mg/L	102	70.0	130
EP040: Total Organic Fluorine (TOF) (QCLot: 5241515)							
EB2325013-002	MW90_PT_02	EP040: Total Organic Fluorine	----	477 µg/L	81.1	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5240993)							
EB2324976-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	87.5	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5240994)							
EB2325002-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5240990)							
EB2324976-003	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	86.8	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5240991)							
EB2325002-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 5241772)							
EB2325045-014	Anonymous	EG020A-F: Manganese	7439-96-5	1 mg/L	116	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5236090)							
EB2324850-003	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	94.1	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5236399)							
EB2325015-003	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	94.2	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5240504)							
EB2325013-003	RS04_GW	EK055G: Ammonia as N	7664-41-7	2 mg/L	115	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5240996)							
EB2324976-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	109	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5240997)							
EB2325002-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	116	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5240500)							
EB2325013-003	RS04_GW	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	98.9	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5240999)							
EB2324976-003	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	108	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5241000)							
EB2325002-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	119	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5236671)							
EB2325036-003	Anonymous	EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00355 µg/L	100	70.0	130
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00376 µg/L	80.0	70.0	130
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00379 µg/L	102	70.0	130
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00381 µg/L	92.8	70.0	130
		EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00371 µg/L	105	70.0	130
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00385 µg/L	124	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5236671)							
EB2325036-003	Anonymous	EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.02 µg/L	97.7	70.0	130
		EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.004 µg/L	84.1	70.0	130
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.004 µg/L	91.9	70.0	130
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.004 µg/L	94.4	70.0	130
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.004 µg/L	85.2	70.0	130
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.004 µg/L	85.2	70.0	130
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.004 µg/L	96.0	70.0	130
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.004 µg/L	118	70.0	130
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.004 µg/L	126	70.0	130
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.004 µg/L	117	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5236671) - continued							
EB2325036-003	Anonymous	EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.01 µg/L	107	70.0	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5236671)							
EB2325036-003	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.004 µg/L	108	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.01 µg/L	123	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.01 µg/L	94.9	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.01 µg/L	101	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.01 µg/L	99.2	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.004 µg/L	119	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.004 µg/L	86.0	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5236671)							
EB2325036-003	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00374 µg/L	116	70.0	130
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0038 µg/L	126	70.0	130
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00384 µg/L	100	70.0	130
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00386 µg/L	# 154	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2325013**	Page	: 1 of 11
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 15-Aug-2023
Site	:	Issue Date	: 22-Aug-2023
Sampler	: MARIA PRSKALO	No. of samples received	: 6
Order number	: ----	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231D: (n:2) Fluorotelomer Sulfonic Acids	QC-5236671-002	----	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	166 %	53.1-133%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2325002--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2325002--001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EB2325036--003	Anonymous	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	154 %	70.0-130%	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
MW90_PT_01, MW90_PT_02	----	----	----	18-Aug-2023	10-Aug-2023	**8**
Clear Plastic Bottle - Natural						
RS04_GW	----	----	----	18-Aug-2023	11-Aug-2023	**7**
EA065: Total Hardness as CaCO3						
Clear Plastic Bottle - Natural						
RS04_GW	----	----	----	21-Aug-2023	18-Aug-2023	**3**
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
RS04_GW	----	----	----	21-Aug-2023	18-Aug-2023	**3**
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural						
MW90_PT_01, MW90_PT_02	----	----	----	17-Aug-2023	12-Aug-2023	**5**
Clear Plastic Bottle - Natural						
RS04_GW	----	----	----	17-Aug-2023	13-Aug-2023	**4**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural						
MW90_PT_01, MW90_PT_02	----	----	----	17-Aug-2023	12-Aug-2023	**5**
Clear Plastic Bottle - Natural						
RS04_GW	----	----	----	17-Aug-2023	13-Aug-2023	**4**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
PFAS by LCMSMS after SPE and oxidation (TOP)	0	3	0.00	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**18-Aug-2023**	10-Aug-2023	×
Clear Plastic Bottle - Natural (EA005-P) RS04_GW	**11-Aug-2023**	**----**	----	----	**18-Aug-2023**	11-Aug-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**18-Aug-2023**	07-Sep-2023	✓
Clear Plastic Bottle - Natural (EA010-P) RS04_GW	**11-Aug-2023**	**----**	----	----	**18-Aug-2023**	08-Sep-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**17-Aug-2023**	17-Aug-2023	✓
Clear Plastic Bottle - Natural (EA025H) RS04_GW	**11-Aug-2023**	**----**	----	----	**17-Aug-2023**	18-Aug-2023	✓
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**19-Aug-2023**	07-Sep-2023	✓
Clear Plastic Bottle - Natural (ED093F) RS04_GW	**11-Aug-2023**	**----**	----	----	**21-Aug-2023**	18-Aug-2023	×
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**18-Aug-2023**	24-Aug-2023	✓
Clear Plastic Bottle - Natural (ED037-P) RS04_GW	**11-Aug-2023**	**----**	----	----	**18-Aug-2023**	25-Aug-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**17-Aug-2023**	07-Sep-2023	✓
Clear Plastic Bottle - Natural (ED041G) RS04_GW	**11-Aug-2023**	**----**	----	----	**17-Aug-2023**	08-Sep-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**17-Aug-2023**	07-Sep-2023	✓
Clear Plastic Bottle - Natural (ED045G) RS04_GW	**11-Aug-2023**	**----**	----	----	**17-Aug-2023**	08-Sep-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**19-Aug-2023**	07-Sep-2023	✓
Clear Plastic Bottle - Natural (ED093F) RS04_GW	**11-Aug-2023**	**----**	----	----	**21-Aug-2023**	18-Aug-2023	×
EG005(ED093)T: Total Metals by ICP-AES							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG005T) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**21-Aug-2023**	06-Feb-2024	✓	**21-Aug-2023**	06-Feb-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG005T) RS04_GW	**11-Aug-2023**	**21-Aug-2023**	07-Feb-2024	✓	**21-Aug-2023**	07-Feb-2024	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**19-Aug-2023**	06-Feb-2024	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**18-Aug-2023**	07-Sep-2023	✓
Clear Plastic Bottle - Natural (EK040P) RS04_GW	**11-Aug-2023**	**----**	----	----	**18-Aug-2023**	08-Sep-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**17-Aug-2023**	07-Sep-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G) RS04_GW	**11-Aug-2023**	**----**	----	----	**17-Aug-2023**	08-Sep-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**17-Aug-2023**	12-Aug-2023	×
Clear Plastic Bottle - Natural (EK057G) RS04_GW	**11-Aug-2023**	**----**	----	----	**17-Aug-2023**	13-Aug-2023	×
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**17-Aug-2023**	07-Sep-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) RS04_GW	**11-Aug-2023**	**----**	----	----	**17-Aug-2023**	08-Sep-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**----**	----	----	**17-Aug-2023**	12-Aug-2023	×
Clear Plastic Bottle - Natural (EK071G) RS04_GW	**11-Aug-2023**	**----**	----	----	**17-Aug-2023**	13-Aug-2023	×
EP040: Total Organic Fluorine (TOF)							
HDPE (no PTFE) (EP040) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**18-Aug-2023**	07-Sep-2023	✓	**20-Aug-2023**	07-Sep-2023	✓
HDPE (no PTFE) (EP040) RS04_GW	**11-Aug-2023**	**18-Aug-2023**	08-Sep-2023	✓	**20-Aug-2023**	08-Sep-2023	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**17-Aug-2023**	06-Feb-2024	✓	**18-Aug-2023**	06-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS04_GW	**11-Aug-2023**	**17-Aug-2023**	07-Feb-2024	✓	**18-Aug-2023**	07-Feb-2024	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**17-Aug-2023**	06-Feb-2024	✓	**18-Aug-2023**	06-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS04_GW	**11-Aug-2023**	**17-Aug-2023**	07-Feb-2024	✓	**18-Aug-2023**	07-Feb-2024	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL (TOP)) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**17-Aug-2023**	06-Feb-2024	✓	**18-Aug-2023**	06-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS04_GW	**11-Aug-2023**	**17-Aug-2023**	07-Feb-2024	✓	**18-Aug-2023**	07-Feb-2024	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**17-Aug-2023**	06-Feb-2024	✓	**18-Aug-2023**	06-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS04_GW	**11-Aug-2023**	**17-Aug-2023**	07-Feb-2024	✓	**18-Aug-2023**	07-Feb-2024	✓
EP231_TOP_P: PFAS Sums							
HDPE (no PTFE) (EP231X-LL (TOP)) MW90_PT_01, MW90_PT_02	**10-Aug-2023**	**17-Aug-2023**	06-Feb-2024	✓	**18-Aug-2023**	06-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS04_GW	**11-Aug-2023**	**17-Aug-2023**	07-Feb-2024	✓	**18-Aug-2023**	07-Feb-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) FB01_GW	**07-Aug-2023**	**17-Aug-2023**	03-Feb-2024	✓	**18-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW90_PT_01, MW90_PT_02, FB02_GW, TB02_GW_210702	**10-Aug-2023**	**17-Aug-2023**	06-Feb-2024	✓	**18-Aug-2023**	06-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS04_GW	**11-Aug-2023**	**17-Aug-2023**	07-Feb-2024	✓	**18-Aug-2023**	07-Feb-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) FB01_GW	**07-Aug-2023**	**17-Aug-2023**	03-Feb-2024	✓	**18-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW90_PT_01, MW90_PT_02, FB02_GW, TB02_GW_210702	**10-Aug-2023**	**17-Aug-2023**	06-Feb-2024	✓	**18-Aug-2023**	06-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS04_GW	**11-Aug-2023**	**17-Aug-2023**	07-Feb-2024	✓	**18-Aug-2023**	07-Feb-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) FB01_GW	**07-Aug-2023**	**17-Aug-2023**	03-Feb-2024	✓	**18-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW90_PT_01, MW90_PT_02, FB02_GW, TB02_GW_210702	**10-Aug-2023**	**17-Aug-2023**	06-Feb-2024	✓	**18-Aug-2023**	06-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS04_GW	**11-Aug-2023**	**17-Aug-2023**	07-Feb-2024	✓	**18-Aug-2023**	07-Feb-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) FB01_GW	**07-Aug-2023**	**17-Aug-2023**	03-Feb-2024	✓	**18-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW90_PT_01, MW90_PT_02, FB02_GW, TB02_GW_210702	**10-Aug-2023**	**17-Aug-2023**	06-Feb-2024	✓	**18-Aug-2023**	06-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS04_GW	**11-Aug-2023**	**17-Aug-2023**	07-Feb-2024	✓	**18-Aug-2023**	07-Feb-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) FB01_GW	**07-Aug-2023**	**17-Aug-2023**	03-Feb-2024	✓	**18-Aug-2023**	03-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW90_PT_01, MW90_PT_02, FB02_GW, TB02_GW_210702	**10-Aug-2023**	**17-Aug-2023**	06-Feb-2024	✓	**18-Aug-2023**	06-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS04_GW	**11-Aug-2023**	**17-Aug-2023**	07-Feb-2024	✓	**18-Aug-2023**	07-Feb-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	3	30	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	0	3	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	8	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	8	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	34	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	9	**33.33**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Ammonia as N by Discrete analyser	EK055G	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	8	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	8	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	34	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Total Recoverable Metals by ICP-AES	EG005T	WATER	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Samples are digested by USEPA 3005 prior to analysis. The ICPAES technique ionises the sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM Schedule B(3).
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Total Organic Fluorine (TOF)	EP040	WATER	In house: Fluorinated organic compounds are isolated from the sample by adsorption onto activated carbon. Hydropyrolytic combustion of the SPE extract converts organic forms of fluorine to hydrogen fluoride (HF). The HF is adsorbed in a trapping solution and the total fluoride concentration determined by Ion Chromatography (IC).
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349. Sample extracts are analysed by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Total Organic Fluorine Preparation - Waters	EP040-PR	WATER	In house - Fluorinated organic compounds are isolated by Solid Phase Extraction (SPE). Inorganic fluorine is displaced by washing with water and organic forms eluted with Methanol.

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Precuror Digest for PFAS - Low Level	* ORG70-SPE	WATER	In-House SPE followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349: A 50 mL sample is concentrated by SPE, taken to near dryness and made up to 5 mL in a reagent solution. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2325216**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: maria.prskalo@ghd.com	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 3316 3333	Facsimile	: +61-7-3243 7218
Project	: 12609270	Page	: 1 of 3
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/005)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: FABIO MANCA		

Dates

Date Samples Received	: 17-Aug-2023 12:30	Issue Date	: 17-Aug-2023
Client Requested Due Date	: 24-Aug-2023	Scheduled Reporting Date	: **24-Aug-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 1.7°C, 2.4°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 11 / 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **An extra sample was received labelled as "Trip Blank 210701" (ALS #11) and has been placed on hold. If testing is required on this sample, please contact ALS Client Services at ALSEnviro.Brisbane@alsglobal.com**
- **Sample "FS02_GW" has been forwarded to EUROFINS, as requested. Please note that this will incur a freight forwarding fee.**
- ***Samples were originally received by ALS GLADSTONE on 15/08/23 and have been forwarded to ALS Brisbane for analysis. Temperature on arrival in ALS Brisbane has been noted above.**
- **PLEASE NOTE: As a DATE was not given on the Chain of Custody or the sample container for sample #11 'Trip Blank 210701, the RELINQUISHED BY Date has been used in its place. If you wish to discuss this further please contact ALS Brisbane Client Services Department at ALSEnviro.Brisbane@alsglobal.com.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA025H Suspended Solids - Standard Level	WATER - EG005T Total Metals by ICPAES (including digestion)	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EP040 Total Organic Fluorine (TOF)	WATER - EP231X-LL (TOP) PFAS - Total Oxidisable Precursor (TOP) Assay -	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29	WATER - NT-13 Extended Water Suite A
EB2325216-001	14-Aug-2023 00:00	MW84_GW	✓	✓	✓	✓	✓	✓	✓
EB2325216-002	14-Aug-2023 00:00	MW85_GW	✓	✓	✓	✓	✓	✓	✓
EB2325216-003	15-Aug-2023 00:00	MW89_GW	✓	✓	✓	✓	✓	✓	✓
EB2325216-004	15-Aug-2023 00:00	MW91_GW	✓	✓	✓	✓	✓	✓	✓
EB2325216-005	15-Aug-2023 00:00	MW94_GW	✓	✓	✓	✓	✓	✓	✓
EB2325216-006	15-Aug-2023 00:00	MW98_GW	✓	✓	✓	✓	✓	✓	✓
EB2325216-007	15-Aug-2023 00:00	MW78_GW	✓	✓	✓	✓	✓	✓	✓
EB2325216-008	14-Aug-2023 00:00	FD02_GW	✓	✓	✓	✓	✓	✓	✓
EB2325216-009	14-Aug-2023 00:00	TB03_GW_210729						✓	
EB2325216-010	14-Aug-2023 00:00	RS05_GW	✓	✓		✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) WATER No analysis requested
EB2325216-011	15-Aug-2023 00:00	Trip Blank 210701	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received Date	Samples Received Evaluation	Instructions Received Date	Instructions Received Evaluation
EA005-P: pH by Auto Titrator							
FD02_GW	Clear Plastic Bottle - Natural	----	14-Aug-2023	17-Aug-2023	×	----	----
MW78_GW	Clear Plastic Bottle - Natural	----	15-Aug-2023	17-Aug-2023	×	----	----
MW84_GW	Clear Plastic Bottle - Natural	----	14-Aug-2023	17-Aug-2023	×	----	----

MW85_GW	Clear Plastic Bottle - Natural	----	14-Aug-2023	17-Aug-2023	✘	----	----
MW89_GW	Clear Plastic Bottle - Natural	----	15-Aug-2023	17-Aug-2023	✘	----	----
MW91_GW	Clear Plastic Bottle - Natural	----	15-Aug-2023	17-Aug-2023	✘	----	----
MW94_GW	Clear Plastic Bottle - Natural	----	15-Aug-2023	17-Aug-2023	✘	----	----
MW98_GW	Clear Plastic Bottle - Natural	----	15-Aug-2023	17-Aug-2023	✘	----	----
RS05_GW	Clear Plastic Bottle - Natural	----	14-Aug-2023	17-Aug-2023	✘	----	----
EK057G: Nitrite as N by Discrete Analyser							
FD02_GW	Clear Plastic Bottle - Natural	----	16-Aug-2023	17-Aug-2023	✘	----	----
MW84_GW	Clear Plastic Bottle - Natural	----	16-Aug-2023	17-Aug-2023	✘	----	----
MW85_GW	Clear Plastic Bottle - Natural	----	16-Aug-2023	17-Aug-2023	✘	----	----
RS05_GW	Clear Plastic Bottle - Natural	----	16-Aug-2023	17-Aug-2023	✘	----	----
EK071G: Reactive Phosphorus as P-By Discrete Analyser							
FD02_GW	Clear Plastic Bottle - Natural	----	16-Aug-2023	17-Aug-2023	✘	----	----
MW84_GW	Clear Plastic Bottle - Natural	----	16-Aug-2023	17-Aug-2023	✘	----	----
MW85_GW	Clear Plastic Bottle - Natural	----	16-Aug-2023	17-Aug-2023	✘	----	----
RS05_GW	Clear Plastic Bottle - Natural	----	16-Aug-2023	17-Aug-2023	✘	----	----

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) — Email — accountspayableAU@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA) — Email — ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT) — Email — ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT) — Email — ghdlabreports@ghd.com

MARIA PRSKALO

- *AU Certificate of Analysis - NATA (COA) — Email — maria.prskalo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — maria.prskalo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — maria.prskalo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — maria.prskalo@ghd.com
- A4 - AU Tax Invoice (INV) — Email — maria.prskalo@ghd.com
- Chain of Custody (CoC) (COC) — Email — maria.prskalo@ghd.com
- EDI Format - ESDAT (ESDAT) — Email — maria.prskalo@ghd.com
- EDI Format - XTab (XTAB) — Email — maria.prskalo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT) — Email — maria.prskalo@ghd.com

MELANIE WRIGHT

- *AU Certificate of Analysis - NATA (COA) — Email — Melanie.Wright@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — Melanie.Wright@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — Melanie.Wright@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — Melanie.Wright@ghd.com
- Chain of Custody (CoC) (COC) — Email — Melanie.Wright@ghd.com
- EDI Format - ESDAT (ESDAT) — Email — Melanie.Wright@ghd.com
- EDI Format - XTab (XTAB) — Email — Melanie.Wright@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT) — Email — Melanie.Wright@ghd.com

CHAIN OF CUSTODY

ALS Environmental — ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE: Brisbane	
PROJECT: 12609270	**ALS QUOTE NO.:** EN-005-21
ORDER NUMBER:	**COC SEQUENCE NUMBER (Circle)** COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
PROJECT MANAGER: Maria Prskalo	**CONTACT PH:** 0448 844 910
SAMPLER: Fabio Manca	**SAMPLER MOBILE:** 0403 595 430
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**
Email Reports to: maria.prskalo@ghd.com; melanie.wright@ghd.com	
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com	
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:	

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comments:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Maria Prskalo	KSchaefer	KSchaefer	KH
DATE/TIME: *15/08/2023 @ 16:45*	DATE/TIME: 15-8-23 1645	DATE/TIME: 16-8-23 1600	DATE/TIME: 17-08-23 1230

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	NT13 Extended Water Suite A	EA025H Suspended solids - standard level	EG020F Dissolved metals (Fe, Mn)	EG005T Total metals (Fe, Mn)	EP231X-SUT PFAS – Super Ultra Trace Full Suite (28 analytes)	EP231X-LL (TOP) PFAS – Low level TOPA (28 analytes)	EP040 Total Organo Fluorine	
1	MW84_GW	14/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X	
2	MW85_GW	14/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X	
3	MW89_GW	15/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X	
4	MW91_GW	15/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X	
5	MW94_GW	15/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X	
6	MW98_GW	15/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X	
7	MW78_GW	15/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X	
8	FD02_GW	14/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	9	X	X	X	X	X	X	X	
	FS02_GW	14/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 2x60mL Red/Green P, 6x125mL Grey P, 2x20mL Grey P, 2x60mL Grey P	14								
9	TB03_GW_210729	14/08/2023	W	2x125mL Grey P	2					X			
10	RS05_GW	15/08/2023	W	1x500mL Green P, 1x60mL Purple SP, 1x60mL Red/Green P, 2x125mL Grey P, 2x20mL Grey P, 1x60mL Grey P	8	X	X		X	X	X	X	
				TOTAL	96	9	9	8	9	10	9	9	

Additional Information

Environmental Division Brisbane
Work Order Reference
EB2325216

Telephone : +61-7-3243 7222

Please send samples to Eurofins Brisbane

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order	: **EB2325216**	Page	: 1 of 15
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 17-Aug-2023 12:30
Order number	: ----	Date Analysis Commenced	: 17-Aug-2023
C-O-C number	: ----	Issue Date	: 24-Aug-2023 15:03
Sampler	: FABIO MANCA		
Site	:		
Quote number	: EN/005		
No. of samples received	: 11		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- E231X-SUT PFA Super Ultra Trace: The LOR for particular analytes has been raised for particular samples due to matrix interference.
- It is recognised that EK059G (Nitrite + Nitrate) is less than EK057G (Nitrite) for sample MW94_GW (EB2325216-005). However, the difference is within experimental variation of the methods.
- EK071G (Reactive Phosphorous as P): Sample MW85_GW (EB2325216-002) was diluted due to matrix interference. LOR adjusted accordingly.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X-SUT PFAS Super Ultra Trace: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP231X-LL(TOP) PFAS TOPA: Samples 'MW84_GW' (EB2325216-001) and 'FD02_GW' (EB2325216-008) required dilution prior to extraction due to high-level contaminants. LOR values have been adjusted accordingly.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP040: Total Organic Fluorine (TOF) in waters and leachates represents the total fluorine in the organic forms which can be extracted by the SPE method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW84_GW	MW85_GW	MW89_GW	MW91_GW	MW94_GW
				Sampling date / time	14-Aug-2023 00:00	14-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-001	EB2325216-002	EB2325216-003	EB2325216-004	EB2325216-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.33	12.0	7.30	7.49	7.65
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		5560	10400	7620	3430	11300
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		3610	6760	4950	2230	7340
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	10	456	14	<5
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		2500	2700	3060	1200	1540
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	987	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	38	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		552	<1	400	669	631
Total Alkalinity as CaCO3	----	1	mg/L		552	1020	400	669	631
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		763	574	1310	233	1570
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1320	1600	1840	719	2780
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		257	1080	308	131	114
Magnesium	7439-95-4	1	mg/L		452	<1	557	213	304
Sodium	7440-23-5	1	mg/L		315	726	583	311	2070
Potassium	7440-09-7	1	mg/L		<1	40	<1	<1	2
EG005(ED093)T: Total Metals by ICP-AES									
Iron	7439-89-6	0.05	mg/L		0.32	0.27	1.39	0.11	<0.05
Manganese	7439-96-5	0.01	mg/L		<0.01	<0.01	0.07	<0.01	0.04
EG020F: Dissolved Metals by ICP-MS									
Manganese	7439-96-5	0.001	mg/L		0.010	<0.001	0.023	0.008	0.051
Iron	7439-89-6	0.05	mg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.5	0.7	0.5	0.6	1.0
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.04	0.32	0.05	0.04	0.02

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW84_GW	MW85_GW	MW89_GW	MW91_GW	MW94_GW
				Sampling date / time	14-Aug-2023 00:00	14-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-001	EB2325216-002	EB2325216-003	EB2325216-004	EB2325216-005
					Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		<0.01	**0.01**	**0.01**	<0.01	**0.01**
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	**0.27**	**0.01**	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	<0.01	**0.28**	**0.01**	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	<0.05	**0.01**	<0.01	**0.02**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**64.2**	**77.5**	**87.2**	**38.5**	**124**
ø Total Cations	----	0.01	meq/L		**63.7**	**86.5**	**86.6**	**37.6**	**121**
ø Ionic Balance	----	0.01	%		**0.33**	**5.51**	**0.34**	**1.19**	**1.19**
EP040: Total Organic Fluorine (TOF)									
Total Organic Fluorine	----	20	µg/L		**30**	<20	<20	<20	<20
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		**2.02**	**0.052**	**0.029**	**0.131**	**0.015**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		**2.33**	**0.056**	**0.029**	**0.148**	**0.008**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		**15.2**	**0.333**	**0.182**	**0.776**	**0.037**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		**0.800**	**0.012**	**0.007**	**0.022**	<0.002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		**8.35**	**0.109**	**0.055**	**0.053**	**0.023**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.049	<0.002	<0.002	<0.002	<0.002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		**1.12**	**0.03**	**0.02**	**0.08**	<0.01
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		**1.61**	**0.004**	**0.007**	**0.045**	<0.002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		**7.03**	**0.012**	**0.020**	**0.118**	**0.005**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		**0.605**	<0.002	**0.002**	**0.018**	<0.002
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		**1.10**	**0.010**	**0.005**	**0.026**	<0.002
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.049	<0.002	<0.002	<0.002	<0.002
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.049	<0.002	<0.002	<0.002	<0.002

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW84_GW	MW85_GW	MW89_GW	MW91_GW	MW94_GW
				Sampling date / time	14-Aug-2023 00:00	14-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-001	EB2325216-002	EB2325216-003	EB2325216-004	EB2325216-005
					Result	Result	Result	Result	Result
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.049	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.049	<0.002	<0.002	<0.002	<0.002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.049	<0.002	<0.002	<0.002	<0.002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.122	<0.005	<0.005	<0.005	<0.005
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.049	<0.002	<0.002	<0.002	<0.002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.122	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.122	<0.005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.122	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.122	<0.005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.049	<0.002	<0.002	<0.002	<0.002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.049	<0.002	<0.002	<0.002	<0.002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.049	<0.005	<0.005	<0.005	<0.005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.049	<0.005	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.049	<0.005	<0.005	<0.005	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.049	<0.005	<0.005	<0.005	<0.005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		**40.2**	**0.618**	**0.356**	**1.42**	**0.088**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW84_GW	MW85_GW	MW89_GW	MW91_GW	MW94_GW
				Sampling date / time	14-Aug-2023 00:00	14-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-001	EB2325216-002	EB2325216-003	EB2325216-004	EB2325216-005
					Result	Result	Result	Result	Result
EP231_TOP_P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		**23.6**	**0.442**	**0.237**	**0.829**	**0.060**
^ **Sum of TOP C4 - C14 as Fluorine**	----	0.002	µg/L		**25.4**	**0.383**	**0.221**	**0.878**	**0.054**
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		**40.2**	**0.618**	**0.356**	**1.42**	**0.088**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		**2.03**	**0.0547**	**0.0282**	**0.113**	**0.0186**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**2.62**	**0.0531**	**0.0188**	**0.146**	**0.0060**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**16.5**	**0.343**	**0.181**	**0.825**	**0.0338**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.803**	**0.0121**	**0.0069**	**0.0230**	**0.0013**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**9.62**	**0.119**	**0.0666**	**0.0914**	**0.0265**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0317	<0.0016	<0.0005	<0.0016	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		**0.644**	**0.0309**	**0.0142**	**0.0777**	<0.0079
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		**1.08**	<0.0030	**0.0028**	**0.0464**	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		**0.590**	<0.0016	**0.0015**	**0.0189**	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		**4.89**	**0.0022**	**0.0121**	**0.110**	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		**1.02**	**0.0084**	**0.0042**	**0.0265**	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0317	<0.0016	<0.0005	<0.0016	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0317	<0.0016	<0.0005	<0.0016	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0317	<0.0016	<0.0005	<0.0016	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0317	<0.0016	<0.0005	<0.0016	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0317	<0.0016	<0.0005	<0.0016	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0794	<0.0040	<0.0005	<0.0040	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW84_GW	MW85_GW	MW89_GW	MW91_GW	MW94_GW
				Sampling date / time	14-Aug-2023 00:00	14-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-001	EB2325216-002	EB2325216-003	EB2325216-004	EB2325216-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0317	<0.0016	<0.0005	<0.0016	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.079	<0.004	<0.001	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.079	<0.004	<0.001	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.079	<0.004	<0.001	<0.004	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.079	<0.004	<0.001	<0.004	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0317	<0.0016	<0.0005	<0.0016	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0317	<0.0016	<0.0005	<0.0016	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.032	<0.002	<0.001	<0.002	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.032	<0.016	<0.001	<0.002	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.032	<0.002	<0.001	<0.002	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.032	<0.002	<0.001	<0.002	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**26.1**	**0.462**	**0.248**	**0.916**	**0.0603**
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**36.4**	**0.558**	**0.311**	**1.31**	**0.0789**
^ Sum of PFAS	----	0.0002	µg/L		**39.8**	**0.623**	**0.336**	**1.48**	**0.0862**
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**82.2**	**99.3**	**84.4**	**89.4**	**87.9**
13C8-PFOA	----	0.002	%		**93.8**	**92.7**	**94.5**	**90.2**	**91.1**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**93.3**	**104**	**108**	**114**	**97.9**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW84_GW	MW85_GW	MW89_GW	MW91_GW	MW94_GW
				Sampling date / time	14-Aug-2023 00:00	14-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00	15-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-001	EB2325216-002	EB2325216-003	EB2325216-004	EB2325216-005
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**104**	**102**	**93.8**	**98.7**	**98.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MW98_GW	MW78_GW	FD02_GW	TB03_GW_210729	RS05_GW
			Sampling date / time	15-Aug-2023 00:00	15-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00
Compound	CAS Number	LOR	Unit	EB2325216-006	EB2325216-007	EB2325216-008	EB2325216-009	EB2325216-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.93**	**8.17**	**7.97**	**----**	**5.98**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**7700**	**11600**	**6150**	**----**	<1
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	**5000**	**7540**	**4000**	**----**	<1
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**654**	**19**	<5	**----**	<5
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**431**	**1540**	**2550**	**----**	<1
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	**----**	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	**----**	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**982**	**577**	**507**	**----**	**3**
Total Alkalinity as CaCO3	----	1	mg/L	**982**	**577**	**507**	**----**	**3**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**89**	**1560**	**772**	**----**	<1
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**2000**	**2790**	**1380**	**----**	<1
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**29**	**115**	**264**	**----**	<1
Magnesium	7439-95-4	1	mg/L	**87**	**304**	**459**	**----**	<1
Sodium	7440-23-5	1	mg/L	**1590**	**2110**	**323**	**----**	<1
Potassium	7440-09-7	1	mg/L	**3**	**2**	<1	**----**	<1
EG005(ED093)T: Total Metals by ICP-AES								
Iron	7439-89-6	0.05	mg/L	**0.56**	**0.56**	<0.05	**----**	<0.05
Manganese	7439-96-5	0.01	mg/L	**0.14**	**0.06**	<0.01	**----**	<0.01
EG020F: Dissolved Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	**0.121**	**0.052**	**0.010**	**----**	**----**
Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	<0.05	**----**	**----**
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**2.3**	**1.2**	**0.6**	**----**	<0.1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.02**	**0.06**	**0.03**	**----**	**0.03**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW98_GW	MW78_GW	FD02_GW	TB03_GW_210729	RS05_GW
				Sampling date / time	15-Aug-2023 00:00	15-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-006	EB2325216-007	EB2325216-008	EB2325216-009	EB2325216-010
					Result	Result	Result	Result	Result
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		**0.01**	<0.01	<0.01	----	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		**0.48**	<0.01	<0.01	----	<0.01
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		**0.49**	<0.01	<0.01	----	<0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		**0.01**	**0.01**	<0.01	----	<0.01
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**77.9**	**123**	**65.1**	----	**0.06**
ø Total Cations	----	0.01	meq/L		**77.8**	**122**	**65.0**	----	<0.01
ø Ionic Balance	----	0.01	%		**0.03**	**0.05**	**0.10**	----	----
EP040: Total Organic Fluorine (TOF)									
Total Organic Fluorine	----	20	µg/L		<20	<20	**30**	----	<20
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		**0.004**	**0.018**	**1.96**	----	<0.002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		**0.006**	**0.014**	**2.66**	----	<0.002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		**0.067**	**0.095**	**17.8**	----	<0.002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	**0.006**	**1.12**	----	<0.002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		**0.027**	**0.104**	**8.28**	----	<0.002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.002	<0.005	----	<0.002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.01	<0.01	**1.17**	----	<0.01
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	<0.002	**1.62**	----	<0.002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		**0.010**	**0.015**	**7.29**	----	<0.002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	<0.002	**0.601**	----	<0.002
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	**0.004**	**1.05**	----	<0.002
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	<0.002	<0.005	----	<0.002
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.002	<0.005	----	<0.002

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW98_GW	MW78_GW	FD02_GW	TB03_GW_210729	RS05_GW
				Sampling date / time	15-Aug-2023 00:00	15-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-006	EB2325216-007	EB2325216-008	EB2325216-009	EB2325216-010
					Result	Result	Result	Result	Result
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.002	<0.005	----	<0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.002	<0.005	----	<0.002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.002	<0.005	----	<0.002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.005	<0.012	----	<0.005
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.002	<0.005	----	<0.002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.005	<0.012	----	<0.005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.005	<0.012	----	<0.005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.005	<0.012	----	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	<0.005	<0.012	----	<0.005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.002	<0.005	----	<0.002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.002	<0.005	----	<0.002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		**0.114**	**0.256**	**43.6**	----	<0.002

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW98_GW	MW78_GW	FD02_GW	TB03_GW_210729	RS05_GW
				Sampling date / time	15-Aug-2023 00:00	15-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-006	EB2325216-007	EB2325216-008	EB2325216-009	EB2325216-010
					Result	Result	Result	Result	Result
EP231_TOP_P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		**0.094**	**0.199**	**26.1**	**----**	<0.002
^ **Sum of TOP C4 - C14 as Fluorine**	----	0.002	µg/L		**0.071**	**0.161**	**27.5**	**----**	<0.002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		**0.114**	**0.256**	**43.6**	**----**	<0.002
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0095	**0.0212**	**2.05**	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		**0.0054**	**0.0059**	**2.36**	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		**0.0591**	**0.0348**	**15.0**	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		**0.0015**	**0.0011**	**1.28**	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		**0.0400**	**0.0229**	**9.82**	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0032	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0080	<0.0079	**0.588**	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0016	**1.14**	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	**0.651**	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0016	**4.30**	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	**1.07**	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0032	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0032	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0032	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0032	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0032	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0080	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW98_GW	MW78_GW	FD02_GW	TB03_GW_210729	RS05_GW
				Sampling date / time	15-Aug-2023 00:00	15-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-006	EB2325216-007	EB2325216-008	EB2325216-009	EB2325216-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0032	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.008	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.008	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.008	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.008	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0032	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0032	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.003	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	**0.008**	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.003	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.003	<0.001	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		**0.0991**	**0.0577**	**24.8**	<0.0002	<0.0002
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		**0.0991**	**0.0789**	**34.6**	<0.0002	<0.0002
^ Sum of PFAS	----	0.0002	µg/L		**0.106**	**0.0859**	**38.3**	<0.0002	<0.0002
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**98.1**	**89.6**	**102**	**----**	**91.4**
13C8-PFOA	----	0.002	%		**92.8**	**89.8**	**94.4**	**----**	**95.5**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**91.5**	**104**	**99.9**	**108**	**100**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW98_GW	MW78_GW	FD02_GW	TB03_GW_210729	RS05_GW
				Sampling date / time	15-Aug-2023 00:00	15-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00	14-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2325216-006	EB2325216-007	EB2325216-008	EB2325216-009	EB2325216-010
					Result	Result	Result	Result	Result
EP231S: PFAS Surrogate - Continued									
13C8-PFOA	----	0.0005	%		**99.9**	**102**	**100**	**99.8**	**101**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	34	137
13C8-PFOA	----	56	129
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2325216**	Page	: 1 of 14
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 17-Aug-2023
Order number	: ----	Date Analysis Commenced	: 17-Aug-2023
C-O-C number	: ----	Issue Date	: 24-Aug-2023
Sampler	: FABIO MANCA		
Site	:		
Quote number	: EN/005		
No. of samples received	: 11		
No. of samples analysed	: 10		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5242745)									
EB2325013-001	Anonymous	EG005T: Manganese	7439-96-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG005T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EB2325216-008	FD02_GW	EG005T: Manganese	7439-96-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG005T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EP040: Total Organic Fluorine (TOF) (QC Lot: 5241515)									
EB2325013-001	Anonymous	EP040: Total Organic Fluorine	----	20	µg/L	<20	<20	0.0	No Limit
EB2325216-008	FD02_GW	EP040: Total Organic Fluorine	----	20	µg/L	30	30	0.0	No Limit
EA005P: pH by PC Titrator (QC Lot: 5241672)									
EB2325161-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.16	8.18	0.2	0% - 20%
EB2325216-003	MW89_GW	EA005-P: pH Value	----	0.01	pH Unit	7.30	7.30	0.0	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5244009)									
EB2325276-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	4.81	4.71	2.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5241670)									
EB2325161-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	8690	8800	1.2	0% - 20%
EB2325216-003	MW89_GW	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	7620	7490	1.6	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5244006)									
EB2325276-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	145	152	4.4	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5244924)									
EB2324902-011	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	70	74	6.6	0% - 50%
EB2325216-001	MW84_GW	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 5241671)									
EB2325161-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5241671) - continued									
EB2325161-003	Anonymous	ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	482	482	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	482	482	0.0	0% - 20%
EB2325216-003	MW89_GW	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	400	401	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	400	401	0.4	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5244008)									
EB2325276-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1	<1	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5242524)									
EB2325045-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	53	52	0.0	0% - 20%
EB2325258-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	39	40	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5242525)									
EB2325216-006	MW98_GW	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	89	91	2.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5243990)									
EB2325118-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	83	84	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5242530)									
EB2325045-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	94	93	0.0	0% - 20%
EB2325258-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	56	56	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5242531)									
EB2325216-006	MW98_GW	ED045G: Chloride	16887-00-6	1	mg/L	2000	2120	6.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5243987)									
EB2325118-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	520	520	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5244940)									
EB2317669-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	120	122	1.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	46	45	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	363	354	2.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	188	186	0.6	0% - 20%
EB2325216-002	MW85_GW	ED093F: Calcium	7440-70-2	1	mg/L	1080	1110	3.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	726	755	3.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	40	42	3.5	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5244942)									
EB2325208-009	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5244942) - continued									
EB2325109-001	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.288	0.294	2.0	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	5.14	5.30	3.2	0% - 20%
EK040P: Fluoride by PC Titrator (QC Lot: 5241669)									
EB2325161-003	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.9	0.8	0.0	No Limit
EB2325216-003	MW89_GW	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.5	0.4	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 5244007)									
EB2325276-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
EB2325250-036	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.3	0.3	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5244014)									
EB2325208-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2325216-001	MW84_GW	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5244015)									
EB2325253-010	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.0	No Limit
EB2325264-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5242521)									
EB2325045-008	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2325258-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.03	0.03	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5242522)									
EB2325216-006	MW98_GW	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.01	0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5243981)									
EB2325118-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2325208-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5244010)									
EB2325208-003	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.78	0.80	1.9	0% - 20%
EB2325216-001	MW84_GW	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5244011)									
EB2325253-010	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	2.74	2.81	2.6	0% - 20%
EB2325264-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.19	1.18	0.0	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5242527)									
EB2325045-008	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5242528)									
EB2325216-006	MW98_GW	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 5243984)									
EB2325118-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EB2325208-004	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.11	0.11	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5243424)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5243424) - continued									
EB2325130-001	Anonymous	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	0.0019	0.0020	7.8	0% - 50%
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0178	0.0184	3.7	0% - 20%
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	0.0120	0.0128	5.8	0% - 20%
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0241	0.0246	2.0	0% - 20%
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5243424)									
EB2325130-001	Anonymous	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	0.0138	0.0152	9.6	0% - 20%
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.0129	0.0134	3.8	0% - 20%
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	0.0028	0.0028	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0007	0.0007	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	0.0079	0.0081	2.7	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5243424)									
EB2325130-001	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5243424) - continued									
EB2325130-001	Anonymous	EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5243424)									
EB2325130-001	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	0.017	0.016	0.0	0% - 50%
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5243424)									
EB2325130-001	Anonymous	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0260	0.0266	2.3	0% - 20%
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.0989	0.101	2.3	0% - 20%
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	0.111	0.114	2.8	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5242745)								
EG005T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	111	70.0	130
EG005T: Manganese	7439-96-5	0.01	mg/L	<0.01	0.1 mg/L	100	82.0	122
EP040: Total Organic Fluorine (TOF) (QCLot: 5241515)								
EP040: Total Organic Fluorine	----	20	µg/L	<20	477 µg/L	86.6	70.0	120
EA005P: pH by PC Titrator (QCLot: 5241672)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.8	98.0	102
				----	7 pH Unit	99.7	98.0	102
EA005P: pH by PC Titrator (QCLot: 5244009)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.7	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 5241670)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	93.6	90.0	106
				<1	24800 µS/cm	96.9	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 5244006)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	99.8	90.0	106
				<1	12890 µS/cm	102	90.0	106
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5244924)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	97.6	88.0	112
				<5	1000 mg/L	103	88.0	112
				<5	926 mg/L	93.5	84.8	116
ED037P: Alkalinity by PC Titrator (QCLot: 5241671)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	106	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 5244008)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	92.9	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5242524)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	85.0	118
				<1	100 mg/L	95.4	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5242525)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	85.0	118
				<1	100 mg/L	93.5	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5243990)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5243990) - continued								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.5	85.0	118
				<1	100 mg/L	99.4	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 5242530)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.1	90.0	115
				<1	1000 mg/L	101	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5242531)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	91.0	90.0	115
				<1	1000 mg/L	98.4	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 5243987)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.2	90.0	115
				<1	1000 mg/L	106	90.0	115
ED093F: Dissolved Major Cations (QCLot: 5244940)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	108	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.2	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100.0	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.2	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 5244942)								
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.6	89.0	120
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	105	82.0	114
EK040P: Fluoride by PC Titrator (QCLot: 5241669)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	98.1	80.0	117
EK040P: Fluoride by PC Titrator (QCLot: 5244007)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	104	80.0	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5244014)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	104	83.5	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5244015)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	100	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5242521)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5242522)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	98.9	90.0	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5243981)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	97.6	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5244010)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5244010) - continued								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	93.0	85.7	111
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5244011)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	89.9	85.7	111
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5242527)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	98.0	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5242528)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.9	81.7	117
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5243984)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	96.8	81.7	117
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5243412)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.475 µg/L	85.0	44.9	136
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.465 µg/L	72.7	33.2	116
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5243412)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	----	----	----	----
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.5 µg/L	84.1	47.0	123
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5243412)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5243412) - continued								
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5243412)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.0476 µg/L	0.0	0	200
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_P: PFAS Sums (QCLot: 5243412)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5243424)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	96.0	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	97.4	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	88.6	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	96.2	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	108	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	89.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5243424)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	84.5	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	89.2	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	90.0	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	88.4	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	86.8	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	95.6	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	102	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	94.0	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	104	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	79.2	65.0	144

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5243424) - continued								
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	97.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5243424)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	99.6	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	92.5	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	88.8	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	132	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	81.0	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	97.6	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	81.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5243424)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	85.6	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	85.0	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	88.3	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	103	53.1	133
EP231P: PFAS Sums (QCLot: 5243424)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5242745)							
EB2325013-002	Anonymous	EG005T: Manganese	7439-96-5	1 mg/L	102	70.0	130
EP040: Total Organic Fluorine (TOF) (QCLot: 5241515)							
EB2325013-002	Anonymous	EP040: Total Organic Fluorine	----	477 µg/L	81.1	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5242524)							
EB2325045-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5242525)							
EB2325216-002	MW85_GW	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5243990)							
EB2325276-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	90.6	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5242530)							
EB2325045-009	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	88.0	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5242531)							
EB2325216-002	MW85_GW	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5243987)							
EB2325276-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	97.2	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 5244942)							
EB2325109-002	Anonymous	EG020A-F: Manganese	7439-96-5	1 mg/L	103	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5241669)							
EB2325193-006	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	92.2	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 5244007)							
EB2325282-001	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	91.7	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5244014)							
EB2325208-004	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	114	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5244015)							
EB2325083-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	# Not Determined	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5242521)							
EB2325045-009	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	98.6	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5242522)							
EB2325216-002	MW85_GW	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	103	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5243981)							
EB2325276-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	111	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5244010)							
EB2325208-004	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	82.6	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5244011)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5244011) - continued							
EB2325083-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	114	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5242527)							
EB2325045-009	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	82.9	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5242528)							
EB2325216-002	MW85_GW	EK071G: Reactive Phosphorus as P	14265-44-2	2 mg/L	91.5	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 5243984)							
EB2325276-002	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	118	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5243424)							
EB2325130-002	Anonymous	EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00355 µg/L	85.7	70.0	130
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00376 µg/L	71.0	70.0	130
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00379 µg/L	73.8	70.0	130
		EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00381 µg/L	77.7	70.0	130
		EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00371 µg/L	86.2	70.0	130
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00385 µg/L	86.4	70.0	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5243424)							
EB2325130-002	Anonymous	EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.02 µg/L	78.7	70.0	130
		EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.004 µg/L	90.0	70.0	130
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.004 µg/L	74.0	70.0	130
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.004 µg/L	82.8	70.0	130
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.004 µg/L	81.6	70.0	130
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.004 µg/L	90.0	70.0	130
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.004 µg/L	96.4	70.0	130
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.004 µg/L	85.6	70.0	130
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.004 µg/L	92.4	70.0	130
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.004 µg/L	70.8	70.0	130
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.01 µg/L	85.9	70.0	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5243424)							
EB2325130-002	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.004 µg/L	96.0	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.01 µg/L	76.2	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.01 µg/L	73.6	70.0	130
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.01 µg/L	102	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.01 µg/L	71.4	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5243424) - continued							
EB2325130-002	Anonymous	EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.004 µg/L	86.8	70.0	130
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.004 µg/L	80.8	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5243424)							
EB2325130-002	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00374 µg/L	70.2	70.0	130
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0038 µg/L	70.2	70.0	130
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00384 µg/L	89.2	70.0	130
		EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00386 µg/L	113	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2325216**	Page	: 1 of 14
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 17-Aug-2023
Site	:	Issue Date	: 24-Aug-2023
Sampler	: FABIO MANCA	No. of samples received	: 11
Order number	: ----	No. of samples analysed	: 10

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2325045--009	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2325216--002	MW85_GW	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2325216--002	MW85_GW	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK055G: Ammonia as N by Discrete Analyser	EB2325083--001	Anonymous	**Ammonia as N**	7664-41-7	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / **Container** / Client Sample ID(s)		*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
MW84_GW,	MW85_GW	----	----	----	18-Aug-2023	14-Aug-2023	**4**
Clear Plastic Bottle - Natural							
FD02_GW,	RS05_GW	----	----	----	21-Aug-2023	14-Aug-2023	**7**
Clear Plastic Bottle - Natural							
MW89_GW,	MW91_GW,	----	----	----	18-Aug-2023	15-Aug-2023	**3**
MW94_GW,	MW98_GW						
Clear Plastic Bottle - Natural							
MW78_GW		----	----	----	21-Aug-2023	15-Aug-2023	**6**
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Natural							
RS05_GW		----	----	----	23-Aug-2023	21-Aug-2023	**2**
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
RS05_GW		----	----	----	23-Aug-2023	21-Aug-2023	**2**
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural							
MW84_GW,	MW85_GW,	----	----	----	18-Aug-2023	16-Aug-2023	**2**
FD02_GW,	RS05_GW						

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EK057G: Nitrite as N by Discrete Analyser - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	----	----	----	18-Aug-2023	17-Aug-2023	**1**
EK071G: Reactive Phosphorus as P by discrete analyser						
Clear Plastic Bottle - Natural MW84_GW, MW85_GW, FD02_GW, RS05_GW	----	----	----	18-Aug-2023	16-Aug-2023	**2**
Clear Plastic Bottle - Natural MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	----	----	----	18-Aug-2023	17-Aug-2023	**1**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	13	7.69	10.00	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
MW84_GW, MW85_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	14-Aug-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**21-Aug-2023**	14-Aug-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
MW89_GW, MW91_GW, MW94_GW, MW98_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	15-Aug-2023	×
Clear Plastic Bottle - Natural (EA005-P)							
MW78_GW	**15-Aug-2023**	**----**	----	----	**21-Aug-2023**	15-Aug-2023	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
MW84_GW, MW85_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Natural (EA010-P)							
FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**21-Aug-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Natural (EA010-P)							
MW89_GW, MW91_GW, MW94_GW, MW98_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	12-Sep-2023	✓
Clear Plastic Bottle - Natural (EA010-P)							
MW78_GW	**15-Aug-2023**	**----**	----	----	**21-Aug-2023**	12-Sep-2023	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	21-Aug-2023	✓
Clear Plastic Bottle - Natural (EA025H)							
MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	22-Aug-2023	✓
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
MW84_GW, MW85_GW, FD02_GW	**14-Aug-2023**	**----**	----	----	**23-Aug-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)							
MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**----**	----	----	**23-Aug-2023**	12-Sep-2023	✓
Clear Plastic Bottle - Natural (ED093F)							
RS05_GW	**14-Aug-2023**	**----**	----	----	**23-Aug-2023**	21-Aug-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) MW84_GW, MW85_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	28-Aug-2023	✓
Clear Plastic Bottle - Natural (ED037-P) FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**21-Aug-2023**	28-Aug-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW89_GW, MW91_GW, MW94_GW, MW98_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	29-Aug-2023	✓
Clear Plastic Bottle - Natural (ED037-P) MW78_GW	**15-Aug-2023**	**----**	----	----	**21-Aug-2023**	29-Aug-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Natural (ED041G) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	12-Sep-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Natural (ED045G) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	12-Sep-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) MW84_GW, MW85_GW, FD02_GW	**14-Aug-2023**	**----**	----	----	**23-Aug-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**----**	----	----	**23-Aug-2023**	12-Sep-2023	✓
Clear Plastic Bottle - Natural (ED093F) RS05_GW	**14-Aug-2023**	**----**	----	----	**23-Aug-2023**	21-Aug-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005(ED093)T: Total Metals by ICP-AES							
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG005T)							
MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**21-Aug-2023**	10-Feb-2024	✓	**21-Aug-2023**	10-Feb-2024	✓
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG005T)							
MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**21-Aug-2023**	11-Feb-2024	✓	**21-Aug-2023**	11-Feb-2024	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
MW84_GW, MW85_GW, FD02_GW	**14-Aug-2023**	**----**	----	----	**23-Aug-2023**	10-Feb-2024	✓
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)							
MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**----**	----	----	**23-Aug-2023**	11-Feb-2024	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
MW84_GW, MW85_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**21-Aug-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
MW89_GW, MW91_GW, MW94_GW, MW98_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	12-Sep-2023	✓
Clear Plastic Bottle - Natural (EK040P)							
MW78_GW	**15-Aug-2023**	**----**	----	----	**21-Aug-2023**	12-Sep-2023	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	12-Sep-2023	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	16-Aug-2023	✗
Clear Plastic Bottle - Natural (EK057G)							
MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	17-Aug-2023	✗

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	11-Sep-2023	✓
Clear Plastic Bottle - Sulfuric Acid (EK059G) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	12-Sep-2023	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**----**	----	----	**18-Aug-2023**	16-Aug-2023	×
Clear Plastic Bottle - Natural (EK071G) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**----**	----	----	**18-Aug-2023**	17-Aug-2023	×
EP040: Total Organic Fluorine (TOF)							
HDPE (no PTFE) (EP040) MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	11-Sep-2023	✓	**20-Aug-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP040) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	12-Sep-2023	✓	**20-Aug-2023**	12-Sep-2023	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	10-Feb-2024	✓	**23-Aug-2023**	10-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	11-Feb-2024	✓	**23-Aug-2023**	11-Feb-2024	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	10-Feb-2024	✓	**23-Aug-2023**	10-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	11-Feb-2024	✓	**23-Aug-2023**	11-Feb-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL (TOP)) MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	10-Feb-2024	✓	**23-Aug-2023**	10-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	11-Feb-2024	✓	**23-Aug-2023**	11-Feb-2024	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	10-Feb-2024	✓	**23-Aug-2023**	10-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	11-Feb-2024	✓	**23-Aug-2023**	11-Feb-2024	✓
EP231_TOP_P: PFAS Sums							
HDPE (no PTFE) (EP231X-LL (TOP)) MW84_GW, MW85_GW, FD02_GW, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	10-Feb-2024	✓	**23-Aug-2023**	10-Feb-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	11-Feb-2024	✓	**23-Aug-2023**	11-Feb-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) MW84_GW, MW85_GW, FD02_GW, TB03_GW_210729, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	10-Feb-2024	✓	**21-Aug-2023**	10-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	11-Feb-2024	✓	**21-Aug-2023**	11-Feb-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) MW84_GW, MW85_GW, FD02_GW, TB03_GW_210729, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	10-Feb-2024	✓	**21-Aug-2023**	10-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	11-Feb-2024	✓	**21-Aug-2023**	11-Feb-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) MW84_GW, MW85_GW, FD02_GW, TB03_GW_210729, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	10-Feb-2024	✓	**21-Aug-2023**	10-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	11-Feb-2024	✓	**21-Aug-2023**	11-Feb-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) MW84_GW, MW85_GW, FD02_GW, TB03_GW_210729, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	10-Feb-2024	✓	**21-Aug-2023**	10-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	11-Feb-2024	✓	**21-Aug-2023**	11-Feb-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) MW84_GW, MW85_GW, FD02_GW, TB03_GW_210729, RS05_GW	**14-Aug-2023**	**18-Aug-2023**	10-Feb-2024	✓	**21-Aug-2023**	10-Feb-2024	✓
HDPE (no PTFE) (EP231X-SUT) MW89_GW, MW91_GW, MW94_GW, MW98_GW, MW78_GW	**15-Aug-2023**	**18-Aug-2023**	11-Feb-2024	✓	**21-Aug-2023**	11-Feb-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	3	18	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	4	35	**11.43**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	29	**13.79**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	3	27	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	5	44	**11.36**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	13	**7.69**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	0	10	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	4	29	**13.79**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	18	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	29	**20.69**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	4	27	**14.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	4	22	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	29	**10.34**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	30	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Ammonia as N by Discrete analyser	EK055G	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	3	29	**10.34**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	27	**7.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	29	**10.34**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	30	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	2	35	**5.71**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	3	29	**10.34**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	3	44	**6.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	3	29	**10.34**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	30	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Fluorine (TOF)	EP040	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Recoverable Metals by ICP-AES	EG005T	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Total Recoverable Metals by ICP-AES	EG005T	WATER	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Samples are digested by USEPA 3005 prior to analysis. The ICPAES technique ionises the sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM Schedule B(3).
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Total Organic Fluorine (TOF)	EP040	WATER	In house: Fluorinated organic compounds are isolated from the sample by adsorption onto activated carbon. Hydropyrolytic combustion of the SPE extract converts organic forms of fluorine to hydrogen fluoride (HF). The HF is adsorbed in a trapping solution and the total fluoride concentration determined by Ion Chromatography (IC).
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349. Sample extracts are analysed by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM Schedule B(3)
Total Organic Fluorine Preparation - Waters	EP040-PR	WATER	In house - Fluorinated organic compounds are isolated by Solid Phase Extraction (SPE). Inorganic fluorine is displaced by washing with water and organic forms eluted with Methanol.

Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Precuror Digest for PFAS - Low Level	* ORG70-SPE	WATER	In-House SPE followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349: A 50 mL sample is concentrated by SPE, taken to near dryness and made up to 5 mL in a reagent solution. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.



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The Power of Commitment

Soil Sampling Report

Callide Groundwater Bore Drilling Project

CS Energy Limited

06 October 2023

→ **The Power of Commitment**



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Contents

Abbreviations and acronyms **1**

1. Introduction **2**

1.1 Purpose of this report 2

1.2 Scope and limitations 2

1.3 Assumptions 3

2. Methodology **4**

2.1 Sampling locations 4

2.2 Sampling methodology 7

2.2.1 Shallow and deeper sub-surface soil sampling 7

2.2.1.1 Decontamination procedure 7

2.2.2 Solid drill cuttings sampling 7

2.2.3 Water-bearing unit sampling 7

2.3 Sample handling 7

2.4 Analytical schedule 8

3. Results **9**

3.1 Relevant Guidelines 9

3.2 Soil samples 9

PFAS 9

PFAS TOPA 9

3.3 Drill cutting composite samples 13

PFAS 13

PFAS TOPA 13

3.4 Water-bearing unit composite samples 14

3.5 Quality assurance and quality control 14

3.5.1 Field soil sampling program 14

3.5.1.1 Field procedures 14

3.5.1.2 Field QA/QC samples 15

3.5.1.3 Field QA/QC sample results 16

3.5.2 Laboratory QA/QC procedures and reporting 16

3.5.2.1 Laboratory QA/QC results 16

4. References **18**

Table index

Table 2.1 Soil/solid sampling locations summary 4

Table 2.2 Summary of soil/solid samples collected 4

Table 2.3 Analytical schedule and number of collected soil samples 8

Table 3.1 Summary of PFAS TOPA QA/QC compliance 10

Table 3.2 Summary of detected PFAS compounds 11

Table 3.3 Summary of detected PFAS TOPA compounds 11

Table 3.4 Summary of TOPA QAQC compliance 13

Table 3.5 Summary of rinsates and field duplicate samples 15

Table 3.6 QA/QC blank samples analysis 15
Table 3.7 Summary of laboratory quality control sample analysis outliers for soil/solid samples analysis 17
Table 3.8 Summary of laboratory quality control sample analysis outliers for water samples analysis 17

Figure index

Figure 2.1 Soil sampling locations 6
Figure 3.1 Concentrations of detected PFAS compounds in soil samples 12

Appendices

Appendix A Results summary tables
Appendix B Laboratory certificates

Abbreviations and acronyms

Term	Definition
AHD	Australian Height Datum
COC	Chain of Custody
CSE	CS Energy Limited
EC	Electrical conductivity
GHD	GHD Pty Ltd
LOR	Limit of reporting
HDPE	High Density Polyethylene
NA	Not applicable
NATA	National Association of Testing Authorities
ND	Not detected
PFAS	Per- and poly-fluoroalkyl substances
PVC	Polyvinyl chloride
QA	Quality assurance
QC	Quality control
TOC	Total organic carbon
TOPA	Total oxidisable precursor assay

1. Introduction

GHD Pty Ltd completed a drilling and bore installation program as part of the *Callide Groundwater Bore Drilling Project* at CS Energy Limited (CSE) Callide Power Station located near Biloela, in Central Queensland.

CSE has undertaken a series of investigative works at Callide Power Station (the 'Project site') to investigate potential impacts and risks associated with the historical use of Aqueous Film Forming Foam (AFFF) at the site. The preliminary investigations were triggered by the Queensland Government's implementation of the *Environmental Management of Firefighting Foam Operational Policy* issued in July 2016. The policy provided information on the requirements for a three-year transition period to fluorine-free foams, or alternative foams containing at least 99.5% shorter-chain per- and poly-fluoroalkyl substances (PFAS).

Subsequent investigations were commissioned by CSE in response to the Department of Environment and Science (DES) notice to conduct an Environmental Evaluation (EE) (Reference: EPPR00536313 | CCPLRC-100046232, most currently dated 21 August 2023) requiring CSE to investigate and assess the source, cause, and extent of any actual or potential environmental harm resulting from the historical use of AFFF on site.

CSE prepared a scope of work to undertake a targeted drilling and monitoring bore installation program to fulfill the requirements of the EE and to further characterise the potential source and extent of PFAS contamination likely to be caused from the release of AFFF at the premises.

GHD were engaged to undertake the drilling, bore installation, and testing program. The *Callide Groundwater Bore Drilling Project* included the following tasks:

– Drilling and installation of five recovery bores and six monitoring bores
– Soil and drill cuttings sampling and analysis
– Pumping tests on the five recovery bores
– Groundwater sampling of newly installed bores plus one existing bore
– Survey of newly installed bores
– Reporting

The details of the field program are outlined in GHD report *Factual Bore Completion Report*.

1.1 Purpose of this report

The purpose of this report is to document the soils and solids (drill cuttings) sampling methodology and summarise the results of the soil and solid samples analysis.

This report presents factual data collected and observations made during the soil sampling field program. This report should be read in conjunction with the *Factual Bore Completion Report* (GHD 2023a) and the *Groundwater Sampling Report* (GHD 2023c).

1.2 Scope and limitations

This report is subject to the limitations set out below and must be read in conjunction with each of the supporting technical reports summarised in Section 1.1, as well as the assumptions, exclusions, and qualifications within the supporting technical reports.

This report has been prepared by GHD Pty Ltd (GHD) for CS Energy Limited (CSE) for the purpose of responding to a notice to conduct an environmental evaluation issued by the administering authority pursuant to section 326B of the *Environmental Protection Act 1994* (Qld) (EP Act) (the Purpose), and not for any other purpose. The report may be used by Queensland Department of Environment and Science (DES), acting in its capacity as the administering authority (as defined in the EP Act)), and the appointed contaminated land auditor, and Luke Amies (Suitably Qualified Person) for the Purpose. GHD disclaims responsibility and liability to any person other than CSE arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally possible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

While every effort has been made by GHD to assess contamination as required by the scope of services, GHD cannot, guarantee that other issues outside of the scope of services do not remain.

GHD has prepared this report on the basis of information provided by CSE and others who provided information to GHD (including Government authorities and analytical laboratories), which GHD has not independently verified or checked beyond the agreed scope of work. Where drill hole logs, laboratory tests and similar work have been performed and recorded by others the data is included and used in the form provided by others. The responsibility for the accuracy of such data remains with the issuing authority, not with GHD. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described throughout this report. GHD disclaims liability arising from any of the assumptions being incorrect. The opinions, conclusions and any recommendations in this report are based on information obtained from site inspections and sample collection at discrete locations across the site and may not fully represent the conditions that may be encountered across the site at other than these locations. It is emphasised that the actual characteristics of the sub-surface and surface materials may vary significantly between adjacent test points and sample intervals and at locations other than where observations, explorations and investigations have been made. Sub-surface conditions, including groundwater levels and contaminant concentrations can change in a limited time. This should be borne in mind when assessing the data. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date the report was prepared.

It should be noted that because of the inherent uncertainties in the sub-surface evaluations, changed or unanticipated sub-surface conditions may occur that could affect the opinions GHD has expressed, which may need to be re-examined and changed. GHD does not accept responsibility for the consequences of significant variations in the conditions.

An understanding of the site conditions depends on the integration of many pieces of information, some regional, some site specific, some structure-specific and some experienced based. Hence, this report must be read in full and should not be altered, amended, or abbreviated, issued in part, or issued incomplete in any way without prior checking and approval by GHD.

GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date the report was prepared.

1.3 Assumptions

The following assumptions and qualifications are made in relation to the content of this report:

– Sampling locations were determined by CSE

2. Methodology

2.1 Sampling locations

At each of the drilling locations soil and drill cutting samples were collected. For the purposes of this report drill cuttings are defined as comprising of the upper residual soils / fill (soil) and rock chips (solids), produced during the drilling process.

Each sampling point is shown on Figure 2.1 and the location summarised in Table 2.1.

Table 2.1 Soil/solid sampling locations summary

Location ID	Easting	Northing	Ground elevation (m AHD)	Location
MW81	258295.466	7304124.687	210.192	On site, Lower Ring Road
MW82	258241.432	7304075.328	209.023	On site, Lower Ring Road
MW83	257998.064	7303887.72	198.21	On site, Lower Ring Road
MW84	258370.406	7304141.737	213.278	On site, fire track
MW85	258045.167	7303790.073	196.984	On site, fire track
MW86	257074.299	7303520.495	198.203	On site, fire track
MW89	258023.937	7303642.861	192.203	Off site
MW90	258012.324	7303617.432	191.097	Off site
MW91	258097.269	7303613.698	193.772	Off site, Cocups Road
MW94	257792.558	7303623.283	194.311	On site, fire track
MW98	256822.495	7303493.653	190.004	On site, fire track

The soil/solid sampling scope of work included taking samples as follows:

– Shallow sub-surface natural soil samples
– Composite sample of all drill cuttings (soils and solids) for the purposes of characterising the PFAS concentrations in the drill cuttings.
– After the drilling program had commenced CSE requested additional sampling of:
  - Deeper sub-surface soils at approximately 0.5 m depth
  - Composite sample of drill cuttings (solids) along the water-bearing zone identified during drilling (typically where the bore screen was installed, however could span greater than the 6 m screen interval).

A summary of samples collected of the soils/solids is provided in Table 2.2.

Table 2.2 Summary of soil/solid samples collected

Location ID	Shallow sub-surface sample	Deeper sub-surface sample	Water bearing unit composite sample	Drill cuttings composite sample
MW81	MW81_SS_0.45-0.50[2]	–[1]	–[1]	MW81_DC_0.0-25.0
MW82	MW82_SS_0.35-0.45[2]	–[1]	–[1]	MW82_DC_0.0-25.0
MW83	MW83_SS_0.20-0.25	MW83_SS_0.50-0.55	MW83_WB_14.0-19.0	MW83_DC_0.0-37.0
MW84	MW84_SS_0.10-0.20	–[1]	–[1]	MW84_DC_0.0-39.0
MW85	MW85_SS_0.15-0.20	MW85_SS_0.35-0.40	MW85_WB_25.0-34.0	MW85_DC_0.0-40.0
MW86	MW86_SS_0.20-0.25	MW86_SS_0.40-0.45	MW86_WB_9.0-15.0	MW86_DC_0.0-37.0
MW89	MW89_SS_0.20-0.25	MW89_SS_0.50-0.55	MW89_WB_5.0-11.0	MW89_DC_0.0-12.5
MW90	MW90_SS_0.10-0.20	MW90_SS_0.40-0.50	MW90_WB_8.0-27.0	MW90_DC_0.0-31.0

Location ID	Shallow sub-surface sample	Deeper sub-surface sample	Water bearing unit composite sample	Drill cuttings composite sample
MW91	MW91_SS_0.15-0.20	MW91_SS_0.45-0.50	MW91_WB_8.0-27.0	MW91_DC_0.0-30.0
MW94	MW94_SS_0.30-0.35	MW94_SS_0.50-0.55	MW94_WB_19.0-25.0	MW94_DC_0.0-25.0
MW98	MW98_SS_0.25-0.30	MW98_SS_0.45-0.50	MW98_WB_6.0-12.0	MW98_DC_0.0-31.0

Table note:

1. Additional sampling scope requested after these locations had already been completed.
2. Sample taken of natural material underlying fill material



Paper Size ISO A3

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

CS Energy Limited
Soil Sampling Report

Soil sampling locations

Project No. **12609270**
Revision No. **A**
Date **03/10/2023**

FIGURE 2.1

\\ghdnet\GHD\AU\Brisbane\Projects\41\12609270\GIS\Maps\12609270_CallidePowerStation.aprx - 12609270_002_SoilSampling
Print date: 03 Oct 2023 - 10:19

Data source: Basemaps_LatestStateProgram_AllUsers: . DoR: roads (2021), watercourse (2022), cadastre (2023); GHD: sample locations (2023). Created by: thunt2

2.2 Sampling methodology

2.2.1 Shallow and deeper sub-surface soil sampling

Each drilling location was hand augered up to 1 m depth or to natural ground to ensure no underground services were present. At each location, one shallow sub-surface soil sample and one deeper sub-surface soil sample was collected per drilling location.

Prior to hand augering, stones, vegetation, debris, etc. were removed from the ground surface in the sampling location area. The sample location was cleared using a decontaminated hand auger to expose a fresh sampling surface.

Soil sampling was conducted in accordance with the PFAS sampling guideline (PFAS NEMP version 2.0). The soil samples were collected directly from the stainless-steel hand auger, and placed into laboratory supplied containers, which comprised of a plastic container for PFAS, and where required a glass jar.

2.2.1.1 Decontamination procedure

The hand auger was decontaminated between sampling locations using the following procedure:

– Removal of excess soil particles with a brush
– Scrub hand auger with a brush within a solution of potable water and low phosphate detergent (Liquinox®), which is confirmed as PFAS-free
– Rinse hand auger with deionised water three-times
– Final rinse with deionised water

One rinsate sample per day was collected from the hand auger following decontamination.

2.2.2 Solid drill cuttings sampling

Throughout the drilling program, samples were collected from excess drill cuttings returning to surface generated during drilling. A composite sample was collected by taking a small sub-sample from each 1 m of drill cuttings. The composite sample was mixed in a stainless-steel bowl and placed into a laboratory-provided PFAS HDPE jar.

The samples of drill cuttings were analysed to characterise the drilling waste. One sample per location was analysed for PFAS (28 analytes) and PFAS Total Oxidisable Precursor Assay (TOPA) (28 analytes).

2.2.3 Water-bearing unit sampling

A composite sample of the drill cuttings from the water-bearing zone, identified during drilling, was collected by taking a small sub-sample from each 1 m of drill cuttings. The composite sample was mixed and placed into a laboratory-provided PFAS HDPE jar and glass jar. The sample generally corresponded with the installed screened section of the bore, however the sampling interval may be greater than the 6 m screen length.

2.3 Sample handling

The soil/solid samples were logged, collected, and reported by GHD's appointed supervising hydrogeologist. Descriptions of the samples are shown on the borehole logs, provided in the *Factual Bore Completion Report* (GHD, 2023a) and are summarised in the results tables included in Appendix A.

Once collected, the soil samples were placed into ice-chilled insulated containers while in the field and then stored in a fridge. Samples were batched into ice-chilled insulated containers for transport under chain of custody (COC) documentation to laboratories certified by National Association of Testing Authorities (NATA) for analysis. ALS have confirmed that their standard method of sample analysis preparation involved homogenising the sample provided to the laboratory prior to obtaining the analytical sub-sample (GHD, pers. comms, 2023e).

Collection of quality assurance and quality control samples (QA/QC) included duplicates (field blank and field split), rinsate samples from the hand auger, rinsate blanks for PFAS, and transport blanks for PFAS.

2.4 Analytical schedule

The analytical schedule and the number of collected soil samples is summarised in Table 2.3. Results of the soil/solid samples analysis are summarised in Section 3.

Table 2.3 Analytical schedule and number of collected soil samples

Sample type	Parameter	Primary samples	Duplicate samples(1)	Rinsate samples(2)
Shallow sub-surface soils	– PFAS – Full Suite (28 analytes) – PFAS – Total Oxidisable Precursor Assay (TOPA) (28 analytes)	11	2	10
Deeper sub-surface soils	– PFAS – Full Suite (28 analytes)	8	1	
Drill cutting composite samples	– PFAS – Full Suite (28 analytes) – PFAS – TOPA (28 analytes)	11	3	NA
Water-bearing units composite samples	– PFAS – Full Suite (28 analytes) – pH, electrical conductivity (EC), total organic carbon (TOC) – iron (Fe) and manganese (Mn) – PFAS – TOPA (28 analytes)(3)	8	1	NA

Notes:

1. Duplicates (blind and split): 1 duplicate sample in 10 primary samples for soil.
2. Rinsates: rinsate samples from hand auger
3. Analysis of TOPA completed only where PFAS was detected above LOR.

3. Results

The laboratory results are tabulated in Appendix A and the laboratory certificates are included in Appendix B.

3.1 Relevant Guidelines

The guideline values selected to compare the analytical results are:

– PFAS NEMP 2.0 – Human health investigation levels for soils – Industrial / Commercial (HIL D)
– PFAS NEMP 2.0 – Ecological guideline values for soil – Ecological direct exposure
– PFAS NEMP 2.0 – Ecological guideline values for soil – Ecological indirect exposure

The HIL D values have been selected to assess the potential exposure of impacted soils to CSE workers (noting that the likelihood of exposure of workers to soils at depth is low). The ecological direct exposure soil guidelines apply specifically to protection of organisms that live within, or in close contact with soil, such as earthworms and plants. The ecological indirect exposure soil guidelines are to assess the potential risks from dietary exposure of a secondary consumer. The likelihood of direct exposure to soils encountered during drilling (particularly at depth) are low, hence more focus on PFAS concentrations encountered at shallow depths are of greater importance.

3.2 Soil samples

The analytical results for shallow sub-surface and deeper sub-surface soil samples are presented in Table A1, Appendix A. The samples were analysed for PFAS (full suite, 28 analytes) and/or PFAS TOPA (full suite, 28 analytes).

A total of 19 soil samples were collected and analysed for PFAS and 13 soil samples were collected and analysed for PFAS TOPA. Samples that reported a detection of PFAS and PFAS TOPA are listed in Table 3.2 and Table 3.3, respectively. Detected PFAS and PFAS TOPA concentrations are shown on Figure 3.1.

PFAS

PFAS compounds were detected in four out of 19 samples analysed, with concentrations ranging from 0.0002 mg/kg to 0.0051 mg/kg and sum of total PFAS concentrations ranging from 0.0006 mg/kg to 0.0071 mg/kg.

The PFAS compounds detected includes:

– Perfluorobutane sulfonic acid (PFBS) detected in one sample
– Perfluorohexane sulfonic acid (PFHxS) detected in three samples
– Perfluorooctane sulfonic acid (PFOS) detected in three samples
– Perfluoropentanoic acid (PFPeA) detected in one sample
– Perfluorohexanoic acid (PFHxA) detected in two samples

None of the analysed samples exceeded the nominated guidelines.

PFAS TOPA

PFAS TOPA compounds were detected in four out of 13 samples analysed with concentrations ranging from 0.0003 mg/kg to 0.0069 mg/kg and sum of PFAS concentrations ranging from 0.0003 mg/kg to 0.0095 mg/kg.

The PFAS TOPA compounds detected includes:

– PFPeA (TOPA) detected in one sample
– PFHxA (TOPA) detected in two samples
– PFBS (TOPA) detected in two samples
– PFHxS (TOPA) detected in two samples
– PFOS (TOPA) detected in one sample

None of the analysed samples exceeded the nominated guidelines.

The PFAS NEMP 2.0 requires quality assurance when undertaking laboratory analysis of PFAS TOPA. A summary of the compliance objectives from the PFAS NEMP 2.0 and quality assurance results is provided in Table 3.1.

Table 3.1 Summary of PFAS TOPA QA/QC compliance

Item	Objective	Summary of Results	Compliance
Total PFAS concentration post-TOPA	Total PFAS concentration post-TOPA should be equal or greater than the total PFAS concentration pre-TOPA	All results of total PFAS post-TOPA were equal to or greater than that of the concentration pre-TOPA, with the exception of: – MW82_SS_0.35-0.45 (pre-TOPA 0.0006 µg/L, post-TOPA 0.0003 µg/L) – MW83_SS_0.20-0.25 (pre-TOPA 0.0015 µg/L, post-TOPA 0.0007 µg/L)	Yes – with the exception of MW82_SS_0.35-0.45 and MW83_SS_0.20-0.25, both returning Post-TOPA results with a greater than 10% difference that the pre-TOPA analysis
Sum of PFCA post-TOPA	Sum PFCA concentration post-TOPA should be equal or greater than the total PFAS concentration pre-TOPA	All results of the sum PFCA post-TOPA were equal to or greater than that of the concentration pre-TOPA.	Yes
Sum of PFSA post-TOPA	Sum of PFSA post-TOPA should approximate the sum of PFSA pre-TOPA	All results for the sum of PFSA post-TOPA were within the approximate sum of the Pre-TOPA results (10%).	Yes
No PFAA precursors detectable post oxidation	No PFAA precursors detectable post oxidation	No PFAA precursors were detectable in samples.	Yes

The quality assurance assessment of the TOPA analysis above shows that all samples analysed for TOPA comply with the PFAS NEMP 2.0 quality assurance measures for TOPA, with the exception of MW82_SS_0.35-0.45 and MW83_SS_0.20-0.25 (sum of PFAS post-TOPA).

Table 3.2 Summary of detected PFAS compounds

Sample ID	Perfluorobutane sulfonic acid (PFBS) (mg/kg)	Perfluorohexane sulfonic acid (PFHxS) (mg/kg)	Perfluorooctane sulfonic acid (PFOS) (mg/kg)	Perfluoropentanoic acid (PFPeA) (mg/kg)	Perfluorohexanoic acid (PFHxA) (mg/kg)	PFAS (Sum of Total) (mg/kg)
MW81_SS_0.45-0.50	ND	0.0006	0.0051	0.0004	0.0010	0.0071
MW82_SS_0.35-0.45	ND	ND	0.0006	ND	ND	0.0006
MW83_SS_0.20-0.25	ND	0.0002	0.0007	ND	0.0006	0.0015
MW84_SS_0.10-0.20	0.0003	0.0004	ND	ND	ND	0.0007
Table notes: ND = not detected						

Table 3.3 Summary of detected PFAS TOPA compounds

Sample ID	Perfluorobutane sulfonic acid (PFBS) (TOPA) (mg/kg)	Perfluorohexane sulfonic acid (PFHxS) (TOPA) (mg/kg)	Perfluorooctane sulfonic acid (PFOS) (TOPA) (mg/kg)	Perfluoropentanoic acid (PFPeA) (TOPA) (mg/kg)	Perfluorohexanoic acid (PFHxA) (TOPA) (mg/kg)	PFAS TOPA (Sum of Total) (mg/kg)
MW81_SS_0.45-0.50	ND	0.0008	0.0069	0.0005	0.0013	0.0095
MW82_SS_0.35-0.45	0.00003	ND	ND	ND	ND	0.0003
MW83_SS_0.20-0.25	ND	ND	ND	ND	0.0007	0.0007
MW84_SS_0.10-0.20	0.0005	0.0003	ND	ND	ND	0.0008
Table notes: ND = not detected						

Legend

- New monitoring bore
- New recovery bore
- Road
- Major watercourse
- Minor watercourse
- Land parcel

Sample ID	Analysis	PFBS	PFHxS	Sum of Total
MW84_SS_0.10-0.20	PFAS (µg/L)	0.0003	0.0004	0.0007
	PFAS TOPA (µg/L)	0.0005	0.0003	0.0008

Sample ID	Analysis	PFHxS	PFOS	PFPeA	PFHxA	Sum of Total
MW81_SS_0.45-0.50	PFAS (µg/L)	0.0006	0.0051	0.0004	0.001	0.0071
	PFAS TOPA (µg/L)	0.0008	0.0069	0.0005	0.0013	0.0095

Sample ID	Analysis	PFBS	PFOS	Sum of Total
MW82_SS_0.35-0.45	PFAS (µg/L)	ND	0.0006	0.0006
	PFAS TOPA (µg/L)	0.00003	ND	0.0003

Sample ID	Analysis	PFHxS	PFOS	PFHxA	Sum of Total
MW83_SS_0.20-0.25	PFAS (µg/L)	0.0002	0.0007	0.0006	0.0015
	PFAS TOPA (µg/L)	ND	ND	0.0007	0.0007

MW84
MW81
MW82
MW83
MW85
MW89
MW90
MW91
MW94
MW86
MW98

Callide Ash Dam
51RN1618
1CP890133
EMTCP890133
1RP615528
2RP619032
38RN1618
COCUPS ROAD
BILOELA CALLIDE ROAD
Callide Creek
4RP611467
1RP619032
LAKE CALLIDE DRIVE
CALVALE ROAD
43SP266150
5RP912776
5RP611607
Lake Callide

Abbreviations:
PFBS: Perfluorobutane sulfonic acid
PFHxS: Perfluorohexane sulfonic acid
PFOS: Perfluorooctane sulfonic acid
PFPeA: Perfluoropentanoic acid
PFHxA: Perfluorohexanoic acid
ND: Not detected

DRAFT

Paper Size ISO A3
0 50 100 150 200
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

CS energy

CS Energy Limited
Soil Sampling Report

Concentrations of detected PFAS compounds in soil samples

Project No. **12609270**
Revision No. **A**
Date **03/10/2023**

FIGURE 3.1

\\ghdnet\GHD\AU\Brisbane\Projects\41\12609270\GIS\Maps\12609270_CallidePowerStation.aprx - 12609270_004_SoilPFAS
Print date: 03 Oct 2023 - 10:21

Data source: Basemaps_LatestStateProgram_AllUsers: . DoR: roads (2021), watercourse (2022), cadastre (2023); GHD: sample locations (2023). Created by: thunt2

3.3 Drill cutting composite samples

The results for the drill cutting composite samples are tabulated in Table A2, included in Appendix A.

Eleven samples of drill cuttings were submitted to the laboratory for analysis of PFAS and TOPA. Only one sample reported detected PFAS compounds and PFAS TOPA. The purpose of the drill cuttings analysis was for drilling cutting waste characterisation. The drill cutting were disposed into the base of the decommissioned drilling pits. Further details on the waste management are provided in the *Factual Bore Completion Report* (GHD, 2023a).

PFAS

PFAS compounds were detected in one out of 11 samples analysed, with a sum of PFHxS and PFOS concentration of 0.0084 mg/kg and a sum of total PFAS concentration of 0.011 mg/kg.

The PFAS compounds detected in sample MW84_DC_0.0-39.0 includes:

– Perfluorobutane sulfonic acid (PFBS)
– Perfluoropentane sulfonic acid (PFPeS)
– Perfluorohexane sulfonic acid (PFHxS)
– Perfluorohepane sulfonic acid (PFHpS)
– Perfluorooctane sulfonic acid (PFOS)
– Perfluorohexanoic acid (PFHxA)
– Perfluorooctanoic acid (PFOA)

None of the analysed samples exceeded the nominated guidelines.

PFAS TOPA

PFAS TOPA was detected in one out of 11 samples analysed, with a sum of PFHxS and PFOS (TOPA) concentration of 0.0068 mg/kg and a sum of Total PFAS (TOPA) concentration of 0.0096 mg/kg.

The PFAS TOPA detected in sample MW84_DC_0.0-39.0 includes:

– Perfluoropentanoic acid (PFPeA) (TOPA)
– Perfluorohexanoic acid (PFHxA) (TOPA)
– Perfluorooctanoic acid (PFOA) (TOPA)
– Perfluorobutane sulfonic acid (PFBS (TOPA)
– Perfluoropentane sulfonic acid (PFPeS) (TOPA)
– Perfluorohexane sulfonic acid (PFHxS) (TOPA)
– Perfluorooctane sulfonic acid (PFOS) (TOPA)

None of the analysed samples exceeded the nominated guidelines.

A summary of the compliance objectives from the PFAS NEMP 2.0 and quality assurance results is provided in Table 3.4.

Table 3.4 Summary of TOPA QAQC compliance

Item	Objective	Summary of Results	Compliance
Total PFAS concentration post-TOPA	Total PFAS concentration post-TOPA should be equal or greater than the total PFAS concentration pre-TOPA	All results of total PFAS post-TOPA were equal to or greater than that of the concentration pre-TOPA, with the exception of: – MW84_DC_0.0-0.39 (pre-TOPA 0.0110 µg/L, post-TOPA 0.0096 µg/L)	Yes – while MW84_0.0-0.39 post-TOPA results that are less than the Sum of PFAS pre-TOPA, all results are within the 10% decrease that is expected due to analytical variability.

Item	Objective	Summary of Results	Compliance
Sum of PFCA post-TOPA	Sum PFCA concentration post-TOPA should be equal or greater than the total PFAS concentration pre-TOPA	All results of the sum PFCA post-TOPA were equal to or greater than that of the concentration pre-TOPA.	Yes
Sum of PFSA post-TOPA	Sum of PFSA post-TOPA should approximate the sum of PFSA pre-TOPA	All results for the sum of PFSA post-TOPA were within the approximate sum of the Pre-TOPA results (10%)	Yes
No PFAA precursors detectable post oxidation	No PFAA precursors detectable post oxidation	No PFAA precursors were detectable in samples.	Yes

The quality assurance assessment of the TOPA analysis above shows that all samples analysed for TOPA comply with the PFAS NEMP 2.0 quality assurance measures for TOPA.

3.4 Water-bearing unit composite samples

The results for the water-bearing unit composite samples are tabulated in Table A3, included in Appendix A.

Eight water-bearing unit composite samples were collected and submitted for PFAS analysis. None of the samples detected PFAS. All samples were also scheduled for analysis of pH, EC, TOC, iron, and manganese.

3.5 Quality assurance and quality control

QA/QC procedures were adopted during the fieldwork based on the minimum requirements detailed in the New South Wales Environmental Protection Agency (2022) *Contaminated Land Guidelines: Sampling design part 1 – application*, and on the guidance given in the PFAS NEMP 2.0. The QA/QC system allows the collected data to be assessed and to provide evidence that the data is fit for interpretive use. QA/QC sampling was carried out by GHD field personnel during soil sampling program.

3.5.1 Field soil sampling program

The results of the QA/QC samples are tabulated in Appendix A.

3.5.1.1 Field procedures

- Field activities were compliant with GHD standard operating procedures (SOPs) which are in accordance with industry standards and PFAS NEMP 2.0 guidance.
- Field activities were documented using standardised templates and GHD SOPs.
- Samples collected from the hand auger were immediately transferred to laboratory-provided sample containers of appropriate type for the required laboratory analysis. All sample containers were clearly labelled with a sample number, project number, and sample date.
- Composite samples were sub-sampled and mixed in a stainless-steel bowl before being transferred to laboratory-provided sample containers of appropriate type for the required laboratory analysis.
- A chain of custody (CoC) form was completed and forwarded to the nominated National Association of Testing Authorities (NATA) testing laboratory along with the associated samples.
- Field equipment (i.e., hand auger) was decontaminated according to GHD's SOPs.
- Duplicate samples were collected at ratio of 1:10 samples.

3.5.1.2 Field QA/QC samples

Quality control samples (blind and split duplicate and their respective parent samples, rinsates and transport blanks) were collected during the program for the purposes of assessing the reproducibility of sample analysis results. The QA/QC samples collected during the program are as follows and details of individual samples collected are provided in Table 3.5 and Table 3.4.

– Field replicates (blind intra-laboratory and split inter-laboratory duplicates): Blind and split duplicate samples were collected at a rate of 1 in 10 primary samples, with the blind sample being submitted to the primary laboratory (ALS) and the split being submitted to the secondary laboratory (Eurofins Environmental).
– Rinsate samples: Collected from the hand auger following decontamination to check for potential cross-contamination from the sampling equipment. The rinsate samples were analysed for PFAS Super Ultra Trace and PFAS TOPA Low Level. One rinsate sample was collected after sampling each location. Composite samples were mixed in a stainless-steel bowl. A rinsate sample was not collected from the bowl.
– Field blank (PFAS): A sample of deionised water was collected in the field to ensure that samples are not contaminated during the sampling process. One field blank was collected during the field soil/solid sampling program.
– Transport blank (PFAS): laboratory-prepared samples were provided by ALS. A transport blank was sent with batches of samples to the laboratory. Two samples were collected during the soil/solid sampling program.

The blind and split duplicates and their respective parent samples, and rinsate samples are listed in Table 3.5, and the field blank and transport blank samples that were analysed are listed in Table 3.6.

Table 3.5 Summary of rinsates and field duplicate samples

Location ID	Rinsate sample (hand auger)	Duplicates		
		Parent sample	Blind (intra-laboratory)	Split (inter-laboratory)
MW81	RS02_SS	–	–	–
MW82	–	MW82_SS_0.35-0.45	FD01_SS	FS01_SS
		MW82_DC_0.0-25.0	FD06_DC	FS06_DC
MW83	RS03_SS	MW83_SS_0.20-0.25	–	–
MW84	RS01_SS	MW84_SS_0.10-0.20	–	–
MW85	RS06_SS	MW85_SS_0.15-0.20	–	–
MW86	RS05_SS	MW86_SS_0.20-0.25	–	–
MW89	RS08_SS	MW89_SS_0.20-0.25	FD02_SS	FS02_SS
		MW89_SS_0.50-0.55	FD03_SS	FS03_SS
		MW89_WB_5.0-11.0	FD06_WB	FS06_WB
		MW89_DC_0.0-12.5	FD04_DC	FS04_DC
MW90	RS10_SS	MW90_DC_0.0-30.0	FD06	FS06
MW91	RS09_SS	MW91_SS_0.15-0.20	–	–
MW94	RS04_SS	MW94_SS_0.30-0.35	–	–
MW98	–	MW98_SS_0.25-0.30	–	–

Table 3.6 QA/QC blank samples analysis

Analysis	Field blank	Transport blank
PFAS Super Ultra Trace	1 sample (FB01_SS)	2 samples (TB01_SS and TB02_SS)
PFAS TOPA Low Level		

3.5.1.3 Field QA/QC sample results

Sample duplicates

The data quality objectives (DQO) for acceptable blind and split duplicates RPD are as follows:

– Concentration result of <10 x LOR = no RPD limit.
– Concentration result of 10-20 x LOR = acceptable RPD range 0 – 50%.
– Concentration result >20 x LOR = acceptable RPD range 0 – 20%.

A quantitative measure of the accuracy of the analytical results reported is made by calculating the RPDs between the primary, blind, and split results in accordance with the procedure described in AS 4482.1-2005.The duplicate blind and split analytical results are compared with the parent sample in Table A4 in Appendix A.

There were no RPD exceedances, except for:

– PFBS (TOPA) reporting at 0.0003 mg/kg in the parent sample (MW82_SS_0.35-0.45) and less than the LOR (<0.0002 mg/kg) in the blind intra-laboratory sample (FD01_SS). Given the values are trace amount and close to the LOR, this RPD exceedance is not of concern.
– Iron and manganese concentrations in sample MW89_WB_5.0-11.0 reported RPDs of 175% and 107%, respectively, compared with the split inter-laboratory duplicate (FS05_WB). Given the samples were drill chips, obtaining a representative sample selection by the laboratory would be difficult given the heterogeneity of the rock material and size of the chips.

Rinsate samples

All rinsate samples were taken from the decontaminated hand auger.

All analyte concentrations for rinsate samples reported at below the LOR (refer to Table A5 Appendix A). Based on the results it is considered that no cross-contamination of samples occurred during the sampling of each location.

Transport blank samples

All transport blank samples reported concentrations of PFAS at below the LOR (refer to Table A6 Appendix A) and as such no cross-contamination of samples was introduced during the sample preparation activities or sample transportation to the laboratory.

3.5.2 Laboratory QA/QC procedures and reporting

ALS is NATA-accredited for the analyses performed. The internal laboratory QC results are summarised in Section 3.5.2.1 and the laboratory certificates are included in Appendix B. Laboratory analysis precision and accuracy were assessed by calculating the RPD between the primary and the duplicate samples.

3.5.2.1 Laboratory QA/QC results

The laboratory QC reports for the soil/solids sample analysis reported the following:

– Analysis holding time outliers existed for some samples for pH (1:5) and EC (1:5) in soils, as well as for moisture content.
– No method blank value outliers occurred
– No laboratory control outliers occurred
– Some duplicate outliers occurred
– Some matrix spike outliers occurred
– For all regular sample matrices, no surrogate recovery outliers occurred
– No raised LORs occurred

Table 3.7 Summary of laboratory quality control sample analysis outliers for soil/solid samples analysis

Work order	Analysis holding time outliers	Method blank outliers	Laboratory control outliers	Duplicate RPD outliers	Matrix spike outliers	Surrogate recovery
EB2323019	Yes (pH, EC, moisture content)	No	No	Yes Total metals (Mn) PFOS	Yes PFHxS	No
EB2323963	No	No	No	No	No	No
EB2324147	No	No	No	No	No	No
EB2324149	Yes (pH, EC)	No	No	Yes Total metals (Fe, Mn)	No	No

Table 3.8 Summary of laboratory quality control sample analysis outliers for water samples analysis

Work order	Analysis holding time outliers	Method blank outliers	Laboratory control outliers	Duplicate RPD outliers	Matrix spike outliers	Surrogate recovery
EB2323019	No	No	No	No	No	No
EB2323207	No	No	Yes (10:2 FTS)	No	No	No
EB2324155	No	No	No	No	No	No

Refer to laboratory Quality Control Interpretation reports in Appendix B for the results of the outliers.

Laboratory duplicate outliers for soil samples when analysing for metals (particularly iron and manganese) is common, as soils typically have various metals-based compounds that occur naturally in the soils. Sample heterogeneity can result in RPD exceedances.

Based on the laboratory QC results, the analytical results are considered to be appropriate.

4. References

GHD, 2023a. *Callide Groundwater Bore Drilling Project, Factual Bore Completion Report*

GHD, 2023b. *Callide Groundwater Bore Drilling Project, Soil Sampling Report*

GHD, 2023c. *Callide Groundwater Bore Drilling Project, Groundwater Sampling Report*

GHD, 2023d. *Callide Groundwater Bore Drilling Project, Drilling, Testing, and Sampling Plan*

GHD, 2023e. Personal communications (pers. comms) between Maria Prskalo (GHD) and Nathan King (ALS), email dated 06 October 2023

National Chemicals Working Group of the Heads of EPAs Australia and New Zealand (HEPA), 2020. *PFAS National Environmental Management Plan – Version 2.0,* Heads of EPA Australia and New Zealand 2020

National Environment Protection Council (NEPC), 2013. *National Environment Protection (Assessment of Site Contamination) Measure 1999* (ASC NEPM, as amended 2013)

New South Wales (NSW) Environment Protection Authority (EPA), 2022. *Contaminated Land Guidelines: Sampling design part 1 – application*, (Ref. 2022P3915)

Appendix A

Results summary tables

Table A1: Soil samples analysis results

Table A2: Drill cuttings samples analysis results

Table A3: Water-bearing unit samples analysis results

Table A4: Duplicate samples RPD results

Table A5: Rinsate samples analysis results

Table A6: Transport and field and blanks

							Inorganics	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfl				
							Moisture (%)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)
							%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.1	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure												**1**						**10**
PFAS NEMP 2.0 2020 Ecological indirect exposure												**0.01**						
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)										**20**		**20**						**50**
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**	**Sample Description**												
MW81	12 Jul 2023	MW81_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	16.8	<0.0002	<0.0002	0.0006	<0.0002	0.0051	<0.0002	<0.001	0.0004	0.0010	<0.0002	<0.0002
MW82	12 Jul 2023	MW82_SS_0.35-0.45	EB2323019	0.35 - 0.45	SS	Silty CLAY, red-brown, stiff	16.9	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
MW83	14 Jul 2023	MW83_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff	10.5	<0.0002	<0.0002	0.0002	<0.0002	0.0007	<0.0002	<0.001	<0.0002	0.0006	<0.0002	<0.0002
		MW83_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, red-brown, with green-grey cobbles	10.0	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
MW84	11 Jul 2023	MW84_SS_0.10-0.20	EB2323019	0.1 - 0.2	SS	Silty CLAY, red-brown, trace fine-grained sand, stiff	21.2	0.0003	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
MW85	19 Jul 2023	MW85_SS_0.15-0.20	EB2323019	0.15 - 0.2	SS	Sandy CLAY, red-brown and yellow-brown, stiff	12.6	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		MW85_SS_0.35-0.40	EB2323019	0.35 - 0.4	SS	Silty CLAY, red-brown, stiff	6.9	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
MW86	18 Jul 2023	MW86_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff, trace rock	14.8	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		MW86_SS_0.40-0.45	EB2323019	0.4 - 0.45	SS	Silty CLAY, pale grey-brown and yellow, completely weathered rock	16.4	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
MW89	21 Jul 2023	MW89_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Sandy CLAY, brown, fine-grained sand	17.6	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		MW89_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, dark yellow-brown, stiff	17.0	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
MW90	27 Jul 2023	MW90_SS_0.10-0.20	EB2323963	0.1 - 0.2	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	15.9	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		MW90_SS_0.40-0.50	EB2323963	0.4 - 0.5	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	16.3	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
MW91	26 Jul 2023	MW91_SS_0.15-0.20	EB2323963	0.15 - 0.2	SS	Silty CLAY, red-brown, stiff	18.0	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		MW91_SS_0.45-0.50	EB2323963	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	14.4	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
MW94	15 Jul 2023	MW94_SS_0.30-0.35	EB2323019	0.3 - 0.35	SS	Silty CLAY, grey, stiff, completely weathered shale	10.3	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		MW94_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, grey, stiff, completely weathered shale	10.4	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
MW98	18 Jul 2023	MW98_SS_0.25-0.30	EB2323019	0.25 - 0.3	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	12.0	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		MW98_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	6.8	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002

Statistics

Number of Results	19	19	19	19	19	19	19	19	19	19	19	19
Number of Detects	19	1	0	3	0	3	0	0	1	2	0	0
Minimum Concentration	6.8	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
Minimum Detect	6.8	0.0003	ND	0.0002	ND	0.0006	ND	ND	0.0004	0.0006	ND	ND
Maximum Concentration	21.2	0.0003	<0.0002	0.0006	<0.0002	0.0051	<0.0002	<0.001	0.0004	0.001	<0.0002	<0.0002
Maximum Detect	21.2	0.0003	ND	0.0006	ND	0.0051	ND	ND	0.0004	0.001	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

Comments
#1 Indicative purposes only
#2 For indicative purposes only

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

							uoroalkyl Carboxylic Acids						PFAS - Perfluoroalkyl Sulfonamide					
							Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0005
PFAS NEMP 2.0 2020 Ecological direct exposure																		
PFAS NEMP 2.0 2020 Ecological indirect exposure																		
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)																		
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**	**Sample Description**												
MW81	12 Jul 2023	MW81_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
MW82	12 Jul 2023	MW82_SS_0.35-0.45	EB2323019	0.35 - 0.45	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
MW83	14 Jul 2023	MW83_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		MW83_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, red-brown, with green-grey cobbles	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
MW84	11 Jul 2023	MW84_SS_0.10-0.20	EB2323019	0.1 - 0.2	SS	Silty CLAY, red-brown, trace fine-grained sand, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
MW85	19 Jul 2023	MW85_SS_0.15-0.20	EB2323019	0.15 - 0.2	SS	Sandy CLAY, red-brown and yellow-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		MW85_SS_0.35-0.40	EB2323019	0.35 - 0.4	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
MW86	18 Jul 2023	MW86_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff, trace rock	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		MW86_SS_0.40-0.45	EB2323019	0.4 - 0.45	SS	Silty CLAY, pale grey-brown and yellow, completely weathered rock	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
MW89	21 Jul 2023	MW89_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Sandy CLAY, brown, fine-grained sand	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		MW89_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, dark yellow-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
MW90	27 Jul 2023	MW90_SS_0.10-0.20	EB2323963	0.1 - 0.2	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		MW90_SS_0.40-0.50	EB2323963	0.4 - 0.5	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
MW91	26 Jul 2023	MW91_SS_0.15-0.20	EB2323963	0.15 - 0.2	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		MW91_SS_0.45-0.50	EB2323963	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
MW94	15 Jul 2023	MW94_SS_0.30-0.35	EB2323019	0.3 - 0.35	SS	Silty CLAY, grey, stiff, completely weathered shale	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		MW94_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, grey, stiff, completely weathered shale	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
MW98	18 Jul 2023	MW98_SS_0.25-0.30	EB2323019	0.25 - 0.3	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		MW98_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005

Statistics

Number of Results	19	19	19	19	19	19	19	19	19	19	19	19
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

Comments
#1 Indicative purposes only
#2 For indicative purposes only

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

							PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums			PF			
						N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	PFBA (TOPA)	PFPeA (TOPA)	PFHxA (TOPA)	PFHpA (TOPA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure																	
PFAS NEMP 2.0 2020 Ecological indirect exposure																	
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)											**20**						
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**	**Sample Description**											
MW81	12 Jul 2023	MW81_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0057	0.0071	0.0071	<0.001	0.0005	0.0013	<0.0002
MW82	12 Jul 2023	MW82_SS_0.35-0.45	EB2323019	0.35 - 0.45	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0006	0.0006	<0.001	<0.0002	<0.0002	<0.0002
MW83	14 Jul 2023	MW83_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	0.0015	0.0015	<0.001	<0.0002	0.0007	<0.0002
		MW83_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, red-brown, with green-grey cobbles	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-	-	-	-
MW84	11 Jul 2023	MW84_SS_0.10-0.20	EB2323019	0.1 - 0.2	SS	Silty CLAY, red-brown, trace fine-grained sand, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0004	0.0007	0.0007	<0.001	<0.0002	<0.0002	<0.0002
MW85	19 Jul 2023	MW85_SS_0.15-0.20	EB2323019	0.15 - 0.2	SS	Sandy CLAY, red-brown and yellow-brown, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
		MW85_SS_0.35-0.40	EB2323019	0.35 - 0.4	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-	-	-	-
MW86	18 Jul 2023	MW86_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff, trace rock	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
		MW86_SS_0.40-0.45	EB2323019	0.4 - 0.45	SS	Silty CLAY, pale grey-brown and yellow, completely weathered rock	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Sandy CLAY, brown, fine-grained sand	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
		MW89_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, dark yellow-brown, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-	-	-	-
MW90	27 Jul 2023	MW90_SS_0.10-0.20	EB2323963	0.1 - 0.2	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
		MW90_SS_0.40-0.50	EB2323963	0.4 - 0.5	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-	-	-	-
MW91	26 Jul 2023	MW91_SS_0.15-0.20	EB2323963	0.15 - 0.2	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
		MW91_SS_0.45-0.50	EB2323963	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-	-	-	-
MW94	15 Jul 2023	MW94_SS_0.30-0.35	EB2323019	0.3 - 0.35	SS	Silty CLAY, grey, stiff, completely weathered shale	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
		MW94_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, grey, stiff, completely weathered shale	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
MW98	18 Jul 2023	MW98_SS_0.25-0.30	EB2323019	0.25 - 0.3	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
		MW98_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002

Statistics

Number of Results	19	19	19	19	19	19	19	19	13	13	13	13
Number of Detects	0	0	0	0	0	4	4	4	0	1	2	0
Minimum Concentration	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
Minimum Detect	ND	ND	ND	ND	ND	0.0004	0.0006	0.0006	ND	0.0005	0.0007	ND
Maximum Concentration	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0057	0.0071	0.0071	<0.001	0.0005	0.0013	<0.0002
Maximum Detect	ND	ND	ND	ND	ND	0.0057	0.0071	0.0071	ND	0.0005	0.0013	ND

* A Non Detect Multiplier of 0.5 has been applied.

Comments
#1 Indicative purposes only
#2 For indicative purposes only

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

							AS TOPA - Perfluoroalkyl Carboxylic Acids							PFAS TOPA - Perfluoroalkyl Sulfonic Acids				
							PFOA (TOPA)	PFNA (TOPA)	PFDA (TOPA)	PFUnDA (TOPA)	PFDoDA (TOPA)	PFTrDA (TOPA)	PFTeDA (TOPA)	PFBS (TOPA)	PFPeS (TOPA)	PFHxS (TOPA)	PFHpS (TOPA)	PFOS (TOPA)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure							**10[#1]**											**1[#1]**
PFAS NEMP 2.0 2020 Ecological indirect exposure																		**0.01[#2]**
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)							**50[#1]**									**20[#2]**		**20[#2]**
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**	**Sample Description**												
MW81	12 Jul 2023	MW81_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	0.0008	<0.0002	0.0069
MW82	12 Jul 2023	MW82_SS_0.35-0.45	EB2323019	0.35 - 0.45	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	0.0003	<0.0002	<0.0002	<0.0002	<0.0008
MW83	14 Jul 2023	MW83_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
		MW83_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, red-brown, with green-grey cobbles	-	-	-	-	-	-	-	-	-	-	-	-
MW84	11 Jul 2023	MW84_SS_0.10-0.20	EB2323019	0.1 - 0.2	SS	Silty CLAY, red-brown, trace fine-grained sand, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	0.0005	<0.0002	0.0003	<0.0002	<0.0002
MW85	19 Jul 2023	MW85_SS_0.15-0.20	EB2323019	0.15 - 0.2	SS	Sandy CLAY, red-brown and yellow-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		MW85_SS_0.35-0.40	EB2323019	0.35 - 0.4	SS	Silty CLAY, red-brown, stiff	-	-	-	-	-	-	-	-	-	-	-	-
MW86	18 Jul 2023	MW86_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff, trace rock	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		MW86_SS_0.40-0.45	EB2323019	0.4 - 0.45	SS	Silty CLAY, pale grey-brown and yellow, completely weathered rock	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Sandy CLAY, brown, fine-grained sand	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		MW89_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, dark yellow-brown, stiff	-	-	-	-	-	-	-	-	-	-	-	-
MW90	27 Jul 2023	MW90_SS_0.10-0.20	EB2323963	0.1 - 0.2	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		MW90_SS_0.40-0.50	EB2323963	0.4 - 0.5	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	-	-	-	-	-	-	-	-	-	-	-	-
MW91	26 Jul 2023	MW91_SS_0.15-0.20	EB2323963	0.15 - 0.2	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		MW91_SS_0.45-0.50	EB2323963	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	-	-	-	-	-	-	-	-	-	-	-	-
MW94	15 Jul 2023	MW94_SS_0.30-0.35	EB2323019	0.3 - 0.35	SS	Silty CLAY, grey, stiff, completely weathered shale	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		MW94_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, grey, stiff, completely weathered shale	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
MW98	18 Jul 2023	MW98_SS_0.25-0.30	EB2323019	0.25 - 0.3	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
		MW98_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Statistics

Number of Results	13	13	13	13	13	13	13	13	13	13	13	13
Number of Detects	0	0	0	0	0	0	0	2	0	2	0	1
Minimum Concentration	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	0.0003	ND	0.0003	ND	0.0069
Maximum Concentration	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	0.0005	<0.0002	0.0008	<0.0002	0.0069
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	0.0005	ND	0.0008	ND	0.0069

* A Non Detect Multiplier of 0.5 has been applied.

Comments
#1 Indicative purposes only
#2 For indicative purposes only

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

							PFAS TOPA - Perfluoroalkyl Sulfonamide							PFAS TOPA - Fluorotelomer Sulfonic Acids			
						PFDS (TOPA)	FOSA (TOPA)	MeFOSA (TOPA)	EtFOSA (TOPA)	MeFOSAA (TOPA)	MeFOSE (TOPA)	EtFOSE (TOPA)	EtFOSAA (TOPA)	4:2 FTS (TOPA)	6:2 FTS (TOPA)	8:2 FTS (TOPA)	10:2 FTS (TOPA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.0002	0.0002	0.0005	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005
PFAS NEMP 2.0 2020 Ecological direct exposure																	
PFAS NEMP 2.0 2020 Ecological indirect exposure																	
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)																	
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**	**Sample Description**											
MW81	12 Jul 2023	MW81_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
MW82	12 Jul 2023	MW82_SS_0.35-0.45	EB2323019	0.35 - 0.45	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
MW83	14 Jul 2023	MW83_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
		MW83_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, red-brown, with green-grey cobbles	-	-	-	-	-	-	-	-	-	-	-	-
MW84	11 Jul 2023	MW84_SS_0.10-0.20	EB2323019	0.1 - 0.2	SS	Silty CLAY, red-brown, trace fine-grained sand, stiff	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
MW85	19 Jul 2023	MW85_SS_0.15-0.20	EB2323019	0.15 - 0.2	SS	Sandy CLAY, red-brown and yellow-brown, stiff	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
		MW85_SS_0.35-0.40	EB2323019	0.35 - 0.4	SS	Silty CLAY, red-brown, stiff	-	-	-	-	-	-	-	-	-	-	-	-
MW86	18 Jul 2023	MW86_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff, trace rock	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
		MW86_SS_0.40-0.45	EB2323019	0.4 - 0.45	SS	Silty CLAY, pale grey-brown and yellow, completely weathered rock	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Sandy CLAY, brown, fine-grained sand	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
		MW89_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, dark yellow-brown, stiff	-	-	-	-	-	-	-	-	-	-	-	-
MW90	27 Jul 2023	MW90_SS_0.10-0.20	EB2323963	0.1 - 0.2	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
		MW90_SS_0.40-0.50	EB2323963	0.4 - 0.5	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	-	-	-	-	-	-	-	-	-	-	-	-
MW91	26 Jul 2023	MW91_SS_0.15-0.20	EB2323963	0.15 - 0.2	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
		MW91_SS_0.45-0.50	EB2323963	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	-	-	-	-	-	-	-	-	-	-	-	-
MW94	15 Jul 2023	MW94_SS_0.30-0.35	EB2323019	0.3 - 0.35	SS	Silty CLAY, grey, stiff, completely weathered shale	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
		MW94_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, grey, stiff, completely weathered shale	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
MW98	18 Jul 2023	MW98_SS_0.25-0.30	EB2323019	0.25 - 0.3	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
		MW98_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005

Statistics

Number of Results	13	13	13	13	13	13	13	13	13	13	13	13
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

Comments
#1 Indicative purposes only
#2 For indicative purposes only

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

							PFAS TOPA - Sums			
							Sum of PFHxS and PFOS (TOPA)	Sum of PFAS	Sum of TOP C4 - C14 as Fluorine	Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfo_
							mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure										
PFAS NEMP 2.0 2020 Ecological indirect exposure										
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)							**20**[#1]			
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**	**Sample Description**				
MW81	12 Jul 2023	MW81_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	0.0077	0.0095	0.0061	0.0095
MW82	12 Jul 2023	MW82_SS_0.35-0.45	EB2323019	0.35 - 0.45	SS	Silty CLAY, red-brown, stiff	<0.0002	0.0003	<0.0002	0.0003
MW83	14 Jul 2023	MW83_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff	<0.0002	0.0007	0.0005	0.0007
		MW83_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, red-brown, with green-grey cobbles	-	-	-	-
MW84	11 Jul 2023	MW84_SS_0.10-0.20	EB2323019	0.1 - 0.2	SS	Silty CLAY, red-brown, trace fine-grained sand, stiff	0.0003	0.0008	0.0005	0.0008
MW85	19 Jul 2023	MW85_SS_0.15-0.20	EB2323019	0.15 - 0.2	SS	Sandy CLAY, red-brown and yellow-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002
		MW85_SS_0.35-0.40	EB2323019	0.35 - 0.4	SS	Silty CLAY, red-brown, stiff	-	-	-	-
MW86	18 Jul 2023	MW86_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Silty CLAY, red-brown, stiff, trace rock	<0.0002	<0.0002	<0.0002	<0.0002
		MW86_SS_0.40-0.45	EB2323019	0.4 - 0.45	SS	Silty CLAY, pale grey-brown and yellow, completely weathered rock	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.20-0.25	EB2323019	0.2 - 0.25	SS	Sandy CLAY, brown, fine-grained sand	<0.0002	<0.0002	<0.0002	<0.0002
		MW89_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, dark yellow-brown, stiff	-	-	-	-
MW90	27 Jul 2023	MW90_SS_0.10-0.20	EB2323963	0.1 - 0.2	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	<0.0002	<0.0002	<0.0002	<0.0002
		MW90_SS_0.40-0.50	EB2323963	0.4 - 0.5	SS	Sandy CLAY, dark grey-brown, with cobbles, stiff	-	-	-	-
MW91	26 Jul 2023	MW91_SS_0.15-0.20	EB2323963	0.15 - 0.2	SS	Silty CLAY, red-brown, stiff	<0.0002	<0.0002	<0.0002	<0.0002
		MW91_SS_0.45-0.50	EB2323963	0.45 - 0.5	SS	Silty CLAY, red-brown, stiff	-	-	-	-
MW94	15 Jul 2023	MW94_SS_0.30-0.35	EB2323019	0.3 - 0.35	SS	Silty CLAY, grey, stiff, completely weathered shale	<0.0002	<0.0002	<0.0002	<0.0002
		MW94_SS_0.50-0.55	EB2323019	0.5 - 0.55	SS	Silty CLAY, grey, stiff, completely weathered shale	<0.0002	<0.0002	<0.0002	<0.0002
MW98	18 Jul 2023	MW98_SS_0.25-0.30	EB2323019	0.25 - 0.3	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	<0.0002	<0.0002	<0.0002	<0.0002
		MW98_SS_0.45-0.50	EB2323019	0.45 - 0.5	SS	Sandy CLAY, dark red-brown, stiff, with highly weathered rock fragments	<0.0002	<0.0002	<0.0002	<0.0002

Statistics

Number of Results	13	13	13	13
Number of Detects	2	4	3	4
Minimum Concentration	<0.0002	<0.0002	<0.0002	<0.0002
Minimum Detect	0.0003	0.0003	0.0005	0.0003
Maximum Concentration	0.0077	0.0095	0.0061	0.0095
Maximum Detect	0.0077	0.0095	0.0061	0.0095

* A Non Detect Multiplier of 0.5 has been applied.

Comments
#1 Indicative purposes only
#2 For indicative purposes only

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

			PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - Perfluoroalkyl Sulfonamide				
			Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.001	0.0005	0.001
Field ID	**Date**	**Lab Report Number**																						
RS01_SS	11 Jul 2023	EB2323019	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS02_SS	12 Jul 2023	EB2323019	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS03_SS	14 Jul 2023	EB2323019	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS04_SS	15 Jul 2023	EB2323019	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS05_SS	18 Jul 2023	EB2323019	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS06_SS	19 Jul 2023	EB2323019	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS08_SS	21 Jul 2023	EB2323019	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS09_SS	26 Jul 2023	EB2324155	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
RS10_SS	27 Jul 2023	EB2324155	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
Statistics																								
Number of Results			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

					PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums			PFAS TOPA - Perfluoroalkyl Carboxylic Acids											PFAS T	
			N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	PFBA (TOPA)	PFPeA (TOPA)	PFHxA (TOPA)	PFHpA (TOPA)	PFOA (TOPA)	PFNA (TOPA)	PFDA (TOPA)	PFUnDA (TOPA)	PFDoDA (TOPA)	PFTrDA (TOPA)	PFTeDA (TOPA)	PFBS (TOPA)	PFPeS (TOPA)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.001	0.0005	0.001	0.001	0.001	0.001	0.0002	0.0002	0.0002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.002
Field ID	**Date**	**Lab Report Number**																						
RS01_SS	11 Jul 2023	EB2323019	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS02_SS	12 Jul 2023	EB2323019	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS03_SS	14 Jul 2023	EB2323019	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS04_SS	15 Jul 2023	EB2323019	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS05_SS	18 Jul 2023	EB2323019	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS06_SS	19 Jul 2023	EB2323019	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS08_SS	21 Jul 2023	EB2323019	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS09_SS	26 Jul 2023	EB2324155	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
RS10_SS	27 Jul 2023	EB2324155	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
Statistics																								
Number of Results			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

			DPA - Perfluoroalkyl Sulfonic Acids				PFAS TOPA - Perfluoroalkyl Sulfonamide							PFAS TOPA - Fluorotelomer Sulfonic Acids				PFAS TOPA - Sums			
			PFHxS (TOPA)	PFHpS (TOPA)	PFOS (TOPA)	PFDS (TOPA)	FOSA (TOPA)	MeFOSA (TOPA)	EtFOSA (TOPA)	MeFOSAA (TOPA)	MeFOSE (TOPA)	EtFOSE (TOPA)	EtFOSAA (TOPA)	4:2 FTS (TOPA)	6:2 FTS (TOPA)	8:2 FTS (TOPA)	10:2 FTS (TOPA)	Sum of PFHxS and PFOS (TOPA)	Sum of PFAS	Sum of TOP C4 - C14 as Fluorine	Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfo_
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.002	0.005	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.002	0.002
Field ID	**Date**	**Lab Report Number**																			
RS01_SS	11 Jul 2023	EB2323019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS02_SS	12 Jul 2023	EB2323019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS03_SS	14 Jul 2023	EB2323019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS04_SS	15 Jul 2023	EB2323019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS05_SS	18 Jul 2023	EB2323019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS06_SS	19 Jul 2023	EB2323019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS08_SS	21 Jul 2023	EB2323019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS09_SS	26 Jul 2023	EB2324155	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
RS10_SS	27 Jul 2023	EB2324155	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Statistics																					
Number of Results			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

		Inorganics	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
		Moisture (%)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
		%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.1	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005
PFAS NEMP 2.0 2020 Ecological direct exposure							**1**						**10**						
PFAS NEMP 2.0 2020 Ecological indirect exposure							**0.01**												
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)					**20**		**20**						**50**						
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**														
MW81	12 Jul 2023	MW81_DC_0.0-25.0	EB2323019	0 - 25	DC	9.2	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
MW82	13 Jul 2023	MW82_DC_0.0-25.0	EB2323019	0 - 25	DC	7.7	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
MW83	14 Jul 2023	MW83_DC_0.0-37.0	EB2323019	0 - 37	DC	7.4	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
MW84	11 Jul 2023	MW84_DC_0.0-39.0	EB2323019	0 - 39	DC	8.0	0.0004	0.0006	0.0044	0.0002	0.0040	<0.0002	<0.001	<0.0002	0.0010	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
MW85	19 Jul 2023	MW85_DC_0.0-40.0	EB2323019	0 - 40	DC	5.4	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
MW86	18 Jul 2023	MW86_DC_0.0-37.0	EB2323019	0 - 37	DC	2.8	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
MW89	21 Jul 2023	MW89_DC_0.0-12.5	EB2323019	0 - 12.5	DC	5.2	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
MW90	27 Jul 2023	MW90_DC_0.0-31.0	EB2324147	0 - 31	DC	5.9	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
MW91	26 Jul 2023	MW91_DC_0.0-30.0	EB2324147	0 - 30	DC	1.4	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
MW94	15 Jul 2023	MW94_DC_0.0-25.0	EB2323019	0 - 25	DC	7.4	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
MW98	18 Jul 2023	MW98_DC_0.0-31.0	EB2323019	0 - 31	DC	1.0	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Statistics																			
Number of Results		11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Number of Detects		11	1	1	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0
Minimum Concentration		1	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Minimum Detect		1	0.0004	0.0006	0.0044	0.0002	0.004	ND	ND	ND	0.001	ND	0.0004	ND	ND	ND	ND	ND	ND
Maximum Concentration		9.2	0.0004	0.0006	0.0044	0.0002	0.004	<0.0002	<0.001	<0.0002	0.001	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005
Maximum Detect		9.2	0.0004	0.0006	0.0044	0.0002	0.004	ND	ND	ND	0.001	ND	0.0004	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

Comments
#1 Indicative purposes only
#2 For indicative purposes only

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

						PFAS - Perfluoroalkyl Sulfonamide							PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums			PF			
						Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	PFBA (TOPA)	PFPeA (TOPA)	PFHxA (TOPA)	PFHpA (TOPA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.0002	0.0005	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure																							
PFAS NEMP 2.0 2020 Ecological indirect exposure																							
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)																	**20**						
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**																		
MW81	12 Jul 2023	MW81_DC_0.0-25.0	EB2323019	0 - 25	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
MW82	13 Jul 2023	MW82_DC_0.0-25.0	EB2323019	0 - 25	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
MW83	14 Jul 2023	MW83_DC_0.0-37.0	EB2323019	0 - 37	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
MW84	11 Jul 2023	MW84_DC_0.0-39.0	EB2323019	0 - 39	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0084	0.0110	0.0102	<0.001	0.0002	0.0012	<0.0002
MW85	19 Jul 2023	MW85_DC_0.0-40.0	EB2323019	0 - 40	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
MW86	18 Jul 2023	MW86_DC_0.0-37.0	EB2323019	0 - 37	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
MW89	21 Jul 2023	MW89_DC_0.0-12.5	EB2323019	0 - 12.5	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
MW90	27 Jul 2023	MW90_DC_0.0-31.0	EB2324147	0 - 31	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
MW91	26 Jul 2023	MW91_DC_0.0-30.0	EB2324147	0 - 30	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
MW94	15 Jul 2023	MW94_DC_0.0-25.0	EB2323019	0 - 25	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
MW98	18 Jul 2023	MW98_DC_0.0-31.0	EB2323019	0 - 31	DC	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002
Statistics																							
Number of Results						11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Number of Detects						0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1	1	0
Minimum Concentration						<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.001	0.0002	<0.0002	<0.0002
Minimum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0084	0.011	0.0102	ND	0.0002	0.0012	ND
Maximum Concentration						<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0084	0.011	0.0102	<0.001	0.0002	0.0012	<0.0002
Maximum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0084	0.011	0.0102	ND	0.0002	0.0012	ND

* A Non Detect Multiplier of 0.5 has been applied.

Comments
#1 Indicative purposes only
#2 For indicative purposes only

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

						AS TOPA - Perfluoroalkyl Carboxylic Acids							PFAS TOPA - Perfluoroalkyl Sulfonic Acids						PFAS TOPA - Perfluoroalkyl Sulfonamide				
						PFOA (TOPA)	PFNA (TOPA)	PFDA (TOPA)	PFUnDA (TOPA)	PFDoDA (TOPA)	PFTrDA (TOPA)	PFTeDA (TOPA)	PFBS (TOPA)	PFPeS (TOPA)	PFHxS (TOPA)	PFHpS (TOPA)	PFOS (TOPA)	PFDS (TOPA)	FOSA (TOPA)	MeFOSA (TOPA)	EtFOSA (TOPA)	MeFOSAA (TOPA)	MeFOSE (TOPA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0005	0.0002	0.0005
PFAS NEMP 2.0 2020 Ecological direct exposure						**10**[#1]											**1**[#1]						
PFAS NEMP 2.0 2020 Ecological indirect exposure																	**0.01**[#2]						
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)						**50**[#1]									**20**[#2]		**20**[#2]						
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**																		
MW81	12 Jul 2023	MW81_DC_0.0-25.0	EB2323019	0 - 25	DC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
MW82	13 Jul 2023	MW82_DC_0.0-25.0	EB2323019	0 - 25	DC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
MW83	14 Jul 2023	MW83_DC_0.0-37.0	EB2323019	0 - 37	DC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
MW84	11 Jul 2023	MW84_DC_0.0-39.0	EB2323019	0 - 39	DC	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	0.0005	0.0007	0.0039	<0.0002	0.0029	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
MW85	19 Jul 2023	MW85_DC_0.0-40.0	EB2323019	0 - 40	DC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
MW86	18 Jul 2023	MW86_DC_0.0-37.0	EB2323019	0 - 37	DC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
MW89	21 Jul 2023	MW89_DC_0.0-12.5	EB2323019	0 - 12.5	DC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
MW90	27 Jul 2023	MW90_DC_0.0-31.0	EB2324147	0 - 31	DC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
MW91	26 Jul 2023	MW91_DC_0.0-30.0	EB2324147	0 - 30	DC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
MW94	15 Jul 2023	MW94_DC_0.0-25.0	EB2323019	0 - 25	DC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
MW98	18 Jul 2023	MW98_DC_0.0-31.0	EB2323019	0 - 31	DC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
Statistics																							
Number of Results						11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Number of Detects						1	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0
Minimum Concentration						0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
Minimum Detect						0.0002	ND	ND	ND	ND	ND	ND	0.0005	0.0007	0.0039	ND	0.0029	ND	ND	ND	ND	ND	ND
Maximum Concentration						0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	0.0005	0.0007	0.0039	<0.0002	0.0029	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
Maximum Detect						0.0002	ND	ND	ND	ND	ND	ND	0.0005	0.0007	0.0039	ND	0.0029	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

Comments
#1 Indicative purposes only
#2 For indicative purposes only

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

						PFAS TOPA - Fluorotelomer Sulfonic Acids				PFAS TOPA - Sums			
						EtFOSE (TOPA)	EtFOSAA (TOPA)	4:2 FTS (TOPA)	6:2 FTS (TOPA)	8:2 FTS (TOPA)	10:2 FTS (TOPA)	Sum of PFHxS and PFOS (TOPA)	Sum of PFAS	Sum of TOP C4 - C14 as Fluorine	Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfo_
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure															
PFAS NEMP 2.0 2020 Ecological indirect exposure															
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)												**20**[#1]			
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**										
MW81	12 Jul 2023	MW81_DC_0.0-25.0	EB2323019	0 - 25	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
MW82	13 Jul 2023	MW82_DC_0.0-25.0	EB2323019	0 - 25	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
MW83	14 Jul 2023	MW83_DC_0.0-37.0	EB2323019	0 - 37	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
MW84	11 Jul 2023	MW84_DC_0.0-39.0	EB2323019	0 - 39	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0068	0.0096	0.0060	0.0096
MW85	19 Jul 2023	MW85_DC_0.0-40.0	EB2323019	0 - 40	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
MW86	18 Jul 2023	MW86_DC_0.0-37.0	EB2323019	0 - 37	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
MW89	21 Jul 2023	MW89_DC_0.0-12.5	EB2323019	0 - 12.5	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
MW90	27 Jul 2023	MW90_DC_0.0-31.0	EB2324147	0 - 31	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
MW91	26 Jul 2023	MW91_DC_0.0-30.0	EB2324147	0 - 30	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
MW94	15 Jul 2023	MW94_DC_0.0-25.0	EB2323019	0 - 25	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
MW98	18 Jul 2023	MW98_DC_0.0-31.0	EB2323019	0 - 31	DC	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Statistics															
Number of Results						11	11	11	11	11	11	11	11	11	11
Number of Detects						0	0	0	0	0	0	1	1	1	1
Minimum Concentration						<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Minimum Detect						ND	ND	ND	ND	ND	ND	0.0068	0.0096	0.006	0.0096
Maximum Concentration						<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0068	0.0096	0.006	0.0096
Maximum Detect						ND	ND	ND	ND	ND	ND	0.0068	0.0096	0.006	0.0096

* A Non Detect Multiplier of 0.5 has been applied.

Comments
#1 Indicative purposes only
#2 For indicative purposes only

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

								Inorganics			Organic Indicators	Metals		PFAS - Perfluoroalkyl Sulfonic Acids					
								Moisture (%)	pH (Lab)	Electrical conductivity (lab)	Total Organic Carbon	Iron	Manganese	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)
								%	pH units	µS/cm	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL								0.1	0.1	1	0.02	50	5	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure																		**1**	
PFAS NEMP 2.0 2020 Ecological indirect exposure																		**0.01**	
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)																**20**		**20**	
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**	**Description**													
MW83	13 Jul 2023	MW83_WB_14.9-19.0	EB2323019	14.9 - 19	WB	ANDESITE, dark green-grey, slightly weathered		9.3	9.2	275	0.04	23,400	412	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
MW85	19 Jul 2023	MW85_WB_9.0-16.0	EB2323019	9 - 16	WB	ANDESITE, green-grey, trace brown iron staining, distinctly weathered		0.2	9.3	121	0.05	27,600	661	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
MW86	18 Jul 2023	MW86_WB_9.0-15.0	EB2323019	9 - 15	WB	ANDESITE, green-grey, trace grey-brown, distinctly weathered		2.2	10.0	270	0.06	15,700	446	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
MW89	21 Jul 2023	MW89_WB_5.0-11.0	EB2323019	5 - 11	WB	SHALE, purple-grey, distincly weathered, potential Tuff		3.3	9.2	250	0.07	2,890	299	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
MW90	27 Jul 2023	MW90_WB_8.0-27.0	EB2324149	8 - 27	WB	ANDESITE, purple, trace quartz, distinctly weathered / SHALE, purple, dark grey and green, minor quartz inclusions		14.2	9.2	315	0.05	5,520	293	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
MW91	26 Jul 2023	MW91_WB_12.0-18.0	EB2324149	12 - 18	WB	ANDESITE, green-grey, yellow-brown, white-speckled quartz inclusions		8.0	9.4	135	0.06	32,100	410	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
MW94	15 Jul 2023	MW94_WB_19.0-25.0	EB2323019	19 - 25	WB	ANDESITE, green-grey, trace yellow-brown, pale yellow inclusions (limonite?		14.4	9.1	558	0.06	16,200	450	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
MW98	18 Jul 2023	MW98_WB_6.0-12.0	EB2323019	6 - 12	WB	SHALE, red-brown and grey, distincly weathered		0.8	9.8	182	0.06	8,790	537	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Statistics																			
Number of Results								8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects								8	8	8	8	8	8	0	0	0	0	0	0
Minimum Concentration								0.2	9.1	121	0.04	2,890	293	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Minimum Detect								0.2	9.1	121	0.04	2,890	293	ND	ND	ND	ND	ND	ND
Maximum Concentration								14.4	10	558	0.07	32,100	661	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Maximum Detect								14.4	10	558	0.07	32,100	661	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

						PFAS - Perfluoroalkyl Carboxylic Acids											
						Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005
PFAS NEMP 2.0 2020 Ecological direct exposure										**10**								
PFAS NEMP 2.0 2020 Ecological indirect exposure																		
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)										**50**								
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**	**Description**												
MW83	13 Jul 2023	MW83_WB_14.9-19.0	EB2323019	14.9 - 19	WB	ANDESITE, dark green-grey, slightly weathered	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005
MW85	19 Jul 2023	MW85_WB_9.0-16.0	EB2323019	9 - 16	WB	ANDESITE, green-grey, trace brown iron staining, distinctly weathered	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005
MW86	18 Jul 2023	MW86_WB_9.0-15.0	EB2323019	9 - 15	WB	ANDESITE, green-grey, trace grey-brown, distinctly weathered	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005
MW89	21 Jul 2023	MW89_WB_5.0-11.0	EB2323019	5 - 11	WB	SHALE, purple-grey, distincly weathered, potential Tuff	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005
MW90	27 Jul 2023	MW90_WB_8.0-27.0	EB2324149	8 - 27	WB	ANDESITE, purple, trace quartz, distinctly weathered / SHALE, purple, dark grey and green, minor quartz inclusions	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005
MW91	26 Jul 2023	MW91_WB_12.0-18.0	EB2324149	12 - 18	WB	ANDESITE, green-grey, yellow-brown, white-speckled quartz inclusions	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005
MW94	15 Jul 2023	MW94_WB_19.0-25.0	EB2323019	19 - 25	WB	ANDESITE, green-grey, trace yellow-brown, pale yellow inclusions (limonite?	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005
MW98	18 Jul 2023	MW98_WB_6.0-12.0	EB2323019	6 - 12	WB	SHALE, red-brown and grey, distincly weathered	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005
Statistics																		
Number of Results						8	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects						0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration						<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005
Minimum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration						<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005
Maximum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

							PFAS - Perfluoroalkyl Sulfonamide					PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums		
							N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure																		
PFAS NEMP 2.0 2020 Ecological indirect exposure																		
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)																**20**		
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**	**Matrix Desc.**	**Description**												
MW83	13 Jul 2023	MW83_WB_14.9-19.0	EB2323019	14.9 - 19	WB	ANDESITE, dark green-grey, slightly weathered	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
MW85	19 Jul 2023	MW85_WB_9.0-16.0	EB2323019	9 - 16	WB	ANDESITE, green-grey, trace brown iron staining, distinctly weathered	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
MW86	18 Jul 2023	MW86_WB_9.0-15.0	EB2323019	9 - 15	WB	ANDESITE, green-grey, trace grey-brown, distinctly weathered	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
MW89	21 Jul 2023	MW89_WB_5.0-11.0	EB2323019	5 - 11	WB	SHALE, purple-grey, distincly weathered, potential Tuff	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
MW90	27 Jul 2023	MW90_WB_8.0-27.0	EB2324149	8 - 27	WB	ANDESITE, purple, trace quartz, distinctly weathered / SHALE, purple, dark grey and green, minor quartz inclusions	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
MW91	26 Jul 2023	MW91_WB_12.0-18.0	EB2324149	12 - 18	WB	ANDESITE, green-grey, yellow-brown, white-speckled quartz inclusions	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
MW94	15 Jul 2023	MW94_WB_19.0-25.0	EB2323019	19 - 25	WB	ANDESITE, green-grey, trace yellow-brown, pale yellow inclusions (limonite?	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
MW98	18 Jul 2023	MW98_WB_6.0-12.0	EB2323019	6 - 12	WB	SHALE, red-brown and grey, distincly weathered	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
Statistics																		
Number of Results							8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects							0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration							<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
Minimum Detect							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration							<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
Maximum Detect							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)

			PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - Perfluoroalkyl Sulfonamide				
			Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.001	0.0005	0.001
Field ID	**Date**	**Lab Report Number**																						
FB01_SS	19 Jul 2023	EB2323019	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
TB01_SS	25 Jul 2023	EB2323019	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
Statistics																								
Number of Results			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.001
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied.

			PFAS - Fluorotelomer Sulfonic Acids					PFAS - Sums			PFAS TOPA - Perfluoroalkyl Carboxylic Acids											PFAS T	
			N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	PFBA (TOPA)	PFPeA (TOPA)	PFHxA (TOPA)	PFHpA (TOPA)	PFOA (TOPA)	PFNA (TOPA)	PFDA (TOPA)	PFUnDA (TOPA)	PFDoDA (TOPA)	PFTrDA (TOPA)	PFTeDA (TOPA)	PFBS (TOPA)	PFPeS (TOPA)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.001	0.0005	0.001	0.001	0.001	0.001	0.0002	0.0002	0.0002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.002
Field ID	**Date**	**Lab Report Number**																						
FB01_SS	19 Jul 2023	EB2323019	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
TB01_SS	25 Jul 2023	EB2323019	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
Statistics																								
Number of Results			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.0002	<0.0002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied

			PFAS TOPA - Perfluoroalkyl Sulfonic Acids				PFAS TOPA - Perfluoroalkyl Sulfonamide							PFAS TOPA - Fluorotelomer Sulfonic Acids				PFAS TOPA - Sums			
			PFHxS (TOPA)	PFHpS (TOPA)	PFOS (TOPA)	PFDS (TOPA)	FOSA (TOPA)	MeFOSA (TOPA)	EtFOSA (TOPA)	MeFOSAA (TOPA)	MeFOSE (TOPA)	EtFOSE (TOPA)	EtFOSAA (TOPA)	4:2 FTS (TOPA)	6:2 FTS (TOPA)	8:2 FTS (TOPA)	10:2 FTS (TOPA)	Sum of PFHxS and PFOS (TOPA)	Sum of PFAS	Sum of TOP C4 - C14 as Fluorine	Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfo_
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.002	0.005	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.002	0.002
Field ID	**Date**	**Lab Report Number**																			
FB01_SS	19 Jul 2023	EB2323019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
TB01_SS	25 Jul 2023	EB2323019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Statistics																					
Number of Results			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* A Non Detect Multiplier of 0.5 has been applied

							Leach Preparation	Misc.	NA	Inorganics			Organic Indicators	Metals		PFAS - Perfluoroalkyl Sulfonic Acids						
							pH (aqueous extract)	% Moisture_	Sum of WA DWER PFAS (n=10)*	Moisture (%)	pH (Lab)	Electrical conductivity (lab)	Total Organic Carbon	Iron	Manganese	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)
							pH units	%	UG/KG	%	pH units	µS/cm	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.1	1	10	0.1	0.1	1	0.02	20	5	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**	**Depth**																
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	-	-	-	16.9	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001
		FD01_SS	Soil	Field_D	EB2323019		-	-	-	16.6	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001
RPD							-	-	-	2	-	-	-	-	-	0	0	0	0	18	0	0
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	-	-	-	16.9	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001
		FS01_SS	Soil	Interlab_D	1011626		-	13	<10	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	-	-	-	16.9	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001
		FS01_SS	Soil	Interlab_D	1011626		-	14	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	-	-	-	7.7	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FD06_DC	Soil	Field_D	EB2323019		-	-	-	10.0	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
RPD							-	-	-	26	-	-	-	-	-	0	0	0	0	0	0	0
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	-	-	-	7.7	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FS06_DC	Soil	Interlab_D	1011626		-	8.8	<10	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	-	-	-	7.7	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FS06_DC	Soil	Interlab_D	1011626		-	8.3	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	-	-	-	5.2	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FD04_DC	Soil	Field_D	EB2323019		-	-	-	5.4	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
RPD							-	-	-	4	-	-	-	-	-	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	-	-	-	5.2	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FS04_DC	Soil	Interlab_D	1011626		-	7.7	<10	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	-	-	-	5.2	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
	23 Jul 2023	FS04_DC	Soil	Interlab_D	1011626		-	8	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	-	-	-	17.6	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FD02_SS	Soil	Field_D	EB2323019		-	-	-	16.6	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
RPD							-	-	-	6	-	-	-	-	-	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	-	-	-	17.6	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FS02_SS	Soil	Interlab_D	1011626		-	18	<10	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	-	-	-	17.6	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FS02_SS	Soil	Interlab_D	1011626		-	17	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.50-0.55	Soil	Normal	EB2323019	0.5 - 0.55	-	-	-	17.0	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FD03_SS	Soil	Field_D	EB2323019		-	-	-	16.4	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
RPD							-	-	-	4	-	-	-	-	-	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.50-0.55	Soil	Normal	EB2323019	0.5 - 0.55	-	-	-	17.0	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
	22 Jul 2023	FS03_SS	Soil	Interlab_D	1011626		-	16	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_WB_5.0-11.0	Soil	Normal	EB2323019	5 - 11	-	-	-	3.3	9.2	250	0.07	2,890	299	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FD05_WB	Soil	Field_D	EB2323019		-	-	-	3.6	9.2	238	0.07	2,940	373	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
RPD							-	-	-	9	0	5	0	2	22	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_WB_5.0-11.0	Soil	Normal	EB2323019	5 - 11	-	-	-	3.3	9.2	250	0.07	2,890	299	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
	24 Jul 2023	FS05_WB	Soil	Interlab_D	1011626		9.4	4.2	-	-	-	200	<0.1	44,000	990	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	22	0	175	107	0	0	0	0	0	0	0
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	-	-	-	5.9	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
		FD06	Soil	Field_D	EB2324147		-	-	-	14.5	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
RPD							-	-	-	84	-	-	-	-	-	0	0	0	0	0	0	0
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	-	-	-	5.9	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
	07 Aug 2023	FS06_SS	Soil	Interlab_D	1016195		-	12	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	-	-	-	5.9	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001
	07 Aug 2023	FS06_SS	Soil	Interlab_D	1016195		-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary lab**

							PFAS - Perfluoroalkyl Carboxylic Acids										PFAS - Perfluoroalkyl Sulfonamide					
							Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0005
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**	**Depth**																
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FD01_SS	Soil	Field_D	EB2323019		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FS01_SS	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FS01_SS	Soil	Interlab_D	1011626		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FD06_DC	Soil	Field_D	EB2323019		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FS06_DC	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FS06_DC	Soil	Interlab_D	1011626		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FD04_DC	Soil	Field_D	EB2323019		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FS04_DC	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
	23 Jul 2023	FS04_DC	Soil	Interlab_D	1011626		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FD02_SS	Soil	Field_D	EB2323019		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FS02_SS	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FS02_SS	Soil	Interlab_D	1011626		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.50-0.55	Soil	Normal	EB2323019	0.5 - 0.55	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FD03_SS	Soil	Field_D	EB2323019		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.50-0.55	Soil	Normal	EB2323019	0.5 - 0.55	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
	22 Jul 2023	FS03_SS	Soil	Interlab_D	1011626		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_WB_5.0-11.0	Soil	Normal	EB2323019	5 - 11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FD05_WB	Soil	Field_D	EB2323019		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_WB_5.0-11.0	Soil	Normal	EB2323019	5 - 11	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
	24 Jul 2023	FS05_WB	Soil	Interlab_D	1011626		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
		FD06	Soil	Field_D	EB2324147		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
	07 Aug 2023	FS06_SS	Soil	Interlab_D	1016195		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005
RPD							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005
	07 Aug 2023	FS06_SS	Soil	Interlab_D	1016195		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary lab**

								PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums					PFAS	PFAS TOPA - P				
							N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS + PFOA)*	PFAS (Sum of Total)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	PFAS (Sum of Total)(WA DER List)	Perfluorononane sulfonate (PFNS)	PFBA (TOPA)	PFPeA (TOPA)	PFHxA (TOPA)	PFHpA (TOPA)	PFOA (TOPA)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.005	0.0002	0.005	0.0002	0.005	0.001	0.0002	0.0002	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**	**Depth**																
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	-	0.0006	-	0.0006	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FD01_SS	Soil	Field_D	EB2323019		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	-	0.0005	-	0.0005	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
RPD							0	0	0	0	0	18	-	18	-	18	-	0	0	0	0	0
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	-	0.0006	-	0.0006	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FS01_SS	Soil	Interlab_D	1011626		-	-	-	-	-	-	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	-	0.0006	-	0.0006	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FS01_SS	Soil	Interlab_D	1011626		<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005	-	-	-	-	-
RPD							0	0	0	0	0	0	-	0	-	0	-	-	-	-	-	-
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FD06_DC	Soil	Field_D	EB2323019		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
RPD							0	0	0	0	0	0	-	0	-	0	-	0	0	0	0	0
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FS06_DC	Soil	Interlab_D	1011626		-	-	-	-	-	-	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FS06_DC	Soil	Interlab_D	1011626		<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005	-	-	-	-	-
RPD							0	0	0	0	0	0	-	0	-	0	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FD04_DC	Soil	Field_D	EB2323019		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
RPD							0	0	0	0	0	0	-	0	-	0	-	0	0	0	0	0
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FS04_DC	Soil	Interlab_D	1011626		-	-	-	-	-	-	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
	23 Jul 2023	FS04_DC	Soil	Interlab_D	1011626		<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005	-	-	-	-	-
RPD							0	0	0	0	0	0	-	0	-	0	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FD02_SS	Soil	Field_D	EB2323019		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
RPD							0	0	0	0	0	0	-	0	-	0	-	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FS02_SS	Soil	Interlab_D	1011626		-	-	-	-	-	-	<0.005	-	<0.005	-	-	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FS02_SS	Soil	Interlab_D	1011626		<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005	-	-	-	-	-
RPD							0	0	0	0	0	0	-	0	-	0	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.50-0.55	Soil	Normal	EB2323019	0.5 - 0.55	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	-	-	-	-	-
		FD03_SS	Soil	Field_D	EB2323019		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	-	-	-	-	-
RPD							0	0	0	0	0	0	-	0	-	0	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.50-0.55	Soil	Normal	EB2323019	0.5 - 0.55	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	-	-	-	-	-
	22 Jul 2023	FS03_SS	Soil	Interlab_D	1011626		<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005	-	-	-	-	-
RPD							0	0	0	0	0	0	-	0	-	0	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_WB_5.0-11.0	Soil	Normal	EB2323019	5 - 11	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	-	-	-	-	-
		FD05_WB	Soil	Field_D	EB2323019		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	-	-	-	-	-
RPD							0	0	0	0	0	0	-	0	-	0	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_WB_5.0-11.0	Soil	Normal	EB2323019	5 - 11	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	-	-	-	-	-
	24 Jul 2023	FS05_WB	Soil	Interlab_D	1011626		<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005	-	-	-	-	-
RPD							0	0	0	0	0	0	-	0	-	0	-	-	-	-	-	-
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
		FD06	Soil	Field_D	EB2324147		<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
RPD							0	0	0	0	0	0	-	0	-	0	-	0	0	0	0	0
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
	07 Aug 2023	FS06_SS	Soil	Interlab_D	1016195		<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005	-	-	-	-	-
RPD							0	0	0	0	0	0	-	0	-	0	-	-	-	-	-	-
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002
	07 Aug 2023	FS06_SS	Soil	Interlab_D	1016195		-	-	-	-	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary lab**

							erfluoroalkyl Carboxylic Acids						PFAS TOPA - Perfluoroalkyl Sulfonic Acids							PFAS TOPA -		
							PFNA (TOPA)	PFDA (TOPA)	PFUnDA (TOPA)	PFDoDA (TOPA)	PFTrDA (TOPA)	PFTeDA (TOPA)	PFPrS (TOPA)	PFBS (TOPA)	PFPeS (TOPA)	PFHxS (TOPA)	PFHpS (TOPA)	PFOS (TOPA)	PFDS (TOPA)	FOSA (TOPA)	MeFOSA (TOPA)	EtFOSA (TOPA)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.005	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0005
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**	**Depth**																
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	0.0003	<0.0002	<0.0002	<0.0002	<0.0008	<0.0002	<0.0002	<0.0005	<0.0005
		FD01_SS	Soil	Field_D	EB2323019		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0008	<0.0002	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	-	40	0	0	0	0	0	0	0	0
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	0.0003	<0.0002	<0.0002	<0.0002	<0.0008	<0.0002	<0.0002	<0.0005	<0.0005
		FS01_SS	Soil	Interlab_D	1011626		<0.005	<0.005	<0.005	<0.005	0.0053	0.0053	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							0	0	0	0	185	166	-	0	0	0	0	0	0	0	0	0
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	0.0003	<0.0002	<0.0002	<0.0002	<0.0008	<0.0002	<0.0002	<0.0005	<0.0005
		FS01_SS	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
		FD06_DC	Soil	Field_D	EB2323019		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
		FS06_DC	Soil	Interlab_D	1011626		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
		FS06_DC	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
		FD04_DC	Soil	Field_D	EB2323019		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
		FS04_DC	Soil	Interlab_D	1011626		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
	23 Jul 2023	FS04_DC	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
		FD02_SS	Soil	Field_D	EB2323019		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
		FS02_SS	Soil	Interlab_D	1011626		<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							0	0	0	0	187	0	-	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
		FS02_SS	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.50-0.55	Soil	Normal	EB2323019	0.5 - 0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		FD03_SS	Soil	Field_D	EB2323019		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.50-0.55	Soil	Normal	EB2323019	0.5 - 0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	22 Jul 2023	FS03_SS	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_WB_5.0-11.0	Soil	Normal	EB2323019	5 - 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		FD05_WB	Soil	Field_D	EB2323019		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_WB_5.0-11.0	Soil	Normal	EB2323019	5 - 11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	24 Jul 2023	FS05_WB	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
		FD06	Soil	Field_D	EB2324147		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
RPD							0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
	07 Aug 2023	FS06_SS	Soil	Interlab_D	1016195		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
	07 Aug 2023	FS06_SS	Soil	Interlab_D	1016195		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD							0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary lab**

							Perfluoroalkyl Sulfonamide				PFAS TOPA - Fluorotelomer Sulfonic Acids				PFAS TOPA - Sums			
							MeFOSAA (TOPA)	MeFOSE (TOPA)	EtFOSE (TOPA)	EtFOSAA (TOPA)	4:2 FTS (TOPA)	6:2 FTS (TOPA)	8:2 FTS (TOPA)	10:2 FTS (TOPA)	Sum of PFHxS and PFOS (TOPA)	Sum of PFAS	Sum of TOP C4 - C14 as Fluorine	Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfo_
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.0002	0.0005	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**	**Depth**												
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	0.0003	<0.0002	0.0003
		FD01_SS	Soil	Field_D	EB2323019		<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
RPD							0	0	0	0	0	0	0	0	0	40	0	40
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	0.0003	<0.0002	0.0003
		FS01_SS	Soil	Interlab_D	1011626		<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.05	-	-
RPD							0	0	0	0	0	0	0	0	0	0	-	-
MW82	12 Jul 2023	MW82_SS_0.35-0.45	Soil	Normal	EB2323019	0.35 - 0.45	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	0.0003	<0.0002	0.0003
		FS01_SS	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
		FD06_DC	Soil	Field_D	EB2323019		<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
RPD							0	0	0	0	0	0	0	0	0	0	0	0
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
		FS06_DC	Soil	Interlab_D	1011626		<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.05	-	-
RPD							0	0	0	0	0	0	0	0	0	0	-	-
MW82	13 Jul 2023	MW82_DC_0.0-25.0	Soil	Normal	EB2323019	0 - 25	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
		FS06_DC	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
		FD04_DC	Soil	Field_D	EB2323019		<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
RPD							0	0	0	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
		FS04_DC	Soil	Interlab_D	1011626		<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.05	-	-
RPD							0	0	0	0	0	0	0	0	0	0	-	-
MW89	21 Jul 2023	MW89_DC_0.0-12.5	Soil	Normal	EB2323019	0 - 12.5	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
	23 Jul 2023	FS04_DC	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
		FD02_SS	Soil	Field_D	EB2323019		<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
RPD							0	0	0	0	0	0	0	0	0	0	0	0
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
		FS02_SS	Soil	Interlab_D	1011626		<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.05	-	-
RPD							0	0	0	0	0	0	0	0	0	0	-	-
MW89	21 Jul 2023	MW89_SS_0.20-0.25	Soil	Normal	EB2323019	0.2 - 0.25	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
		FS02_SS	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.50-0.55	Soil	Normal	EB2323019	0.5 - 0.55	-	-	-	-	-	-	-	-	-	-	-	-
		FD03_SS	Soil	Field_D	EB2323019		-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_SS_0.50-0.55	Soil	Normal	EB2323019	0.5 - 0.55	-	-	-	-	-	-	-	-	-	-	-	-
	22 Jul 2023	FS03_SS	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_WB_5.0-11.0	Soil	Normal	EB2323019	5 - 11	-	-	-	-	-	-	-	-	-	-	-	-
		FD05_WB	Soil	Field_D	EB2323019		-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-
MW89	21 Jul 2023	MW89_WB_5.0-11.0	Soil	Normal	EB2323019	5 - 11	-	-	-	-	-	-	-	-	-	-	-	-
	24 Jul 2023	FS05_WB	Soil	Interlab_D	1011626		-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
		FD06	Soil	Field_D	EB2324147		<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
RPD							0	0	0	0	0	0	0	0	0	0	0	0
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
	07 Aug 2023	FS06_SS	Soil	Interlab_D	1016195		-	-	-	-	-	-	-	-	-	-	-	-
RPD							-	-	-	-	-	-	-	-	-	-	-	-
MW90	27 Jul 2023	MW90_DC_0.0-31.0	Soil	Normal	EB2324147	0 - 31	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
	07 Aug 2023	FS06_SS	Soil	Interlab_D	1016195		<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.05	-	-
RPD							0	0	0	0	0	0	0	0	0	0	-	-

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 999 (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 (> 20 x EQL))**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary lab**

Appendix B

Laboratory certificates

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

Environmental Division Brisbane
Work Order Reference
EB2323019

Telephone : +61-7-3243 7222

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR LABORATORY ONLY
OFFICE: Brisbane		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? N/A
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	COC SEQUENCE NUMBER (Circle)	Cooling Method: N/A
ORDER NUMBER:		COC: (1) 2 3 4 5 6 7	Random Sample Temp:
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910	OF: 1 2 3 4 (5) 6 7	Other comments:
SAMPLER: Brian Llewellyn	SAMPLER MOBILE: 0409 939 243	RELINQUISHED BY: B. Llewellyn	RECEIVED BY: JB
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 26.7.23 1300hrs	DATE/TIME: 27/7/23 0900
Email Reports to: maria.prskalo@ghd.com			RELINQUISHED BY
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com			DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP231X PFAS - Full suite (28 analytes)	EP231X (TOP) PFAS - TOPA (28 analytes)							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MW81_SS_0.45-0.50	12/07/2023	S	1 x HDPE jar	1	X	X							
2	MW82_SS_0.35-0.45	12/07/2023	S	1 x HDPE jar	1	X	X							
3	MW83_SS_0.20-0.25	14/07/2023	S	1 x HDPE jar	1	X	X							
4	MW83_SS_0.50-0.55	14/07/2023	S	1 x HDPE jar	1	X								
5	MW84_SS_0.10-0.20	11/07/2023	S	1 x HDPE jar	1	X	X							
6	MW85_SS_0.15-0.20	19/07/2023	S	1 x HDPE jar	1	X	X							
7	MW85_SS_0.35-0.40	19/07/2023	S	1 x HDPE jar	1	X								
8	MW86_SS_0.20-0.25	18/07/2023	S	1 x HDPE jar	1	X	X							
9	MW86_SS_0.40-0.45	18/07/2023	S	1 x HDPE jar	1	X								
10	MW89_SS_0.20-0.25	21/07/2023	S	1 x HDPE jar	1	X	X							
11	MW89_SS_0.50-0.55	21/07/2023	S	1 x HDPE jar	1	X								
12	MW98_SS_0.25-0.30	18/07/2023	S	1 x HDPE jar	1	X	X							Container is labelled as MW93_SS_0.25-0.30
				TOTAL	12	12	8							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
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☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT **(List due date):**
OFFICE: Brisbane		☐ Non Standard or urgent TAT **(List due date):**
PROJECT: 12609270	**ALS QUOTE NO.:** EN-005-21	
ORDER NUMBER:		
PROJECT MANAGER: Maria Prskalo	**CONTACT PH:** 0448 844 910	
SAMPLER: Brian Llewellyn	**SAMPLER MOBILE:** 0409 939 243	
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	
Email Reports to: maria.prskalo@ghd.com		
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com		

COC SEQUENCE NUMBER (Circle)

COC: 1 (2) 3 4 5 6 7

OF: 1 2 3 4 (5) 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
B. Llewellyn			
DATE/TIME: 26.7.23 1300hrs	DATE/TIME: 27/7/23 0800	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	EP231X PFAS - Full suite (28 analytes)	EP231X (TOP) PFAS - TOPA (28 analytes)							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	MW98_SS_0.45-0.50	18/07/2023	S	1 x HDPE jar	1	X	X							Container is labelled as MW93_SS_0.45-0.50
14	MW94_SS_0.30-0.35	15/07/2023	S	1 x HDPE jar	1	X	X							
15	MW94_SS_0.50-0.55	15/07/2023	S	1 x HDPE jar	1	X	X							
16	FD01_SS	12/07/2023	S	1 x HDPE jar	1	X	X							
17	FD02_SS	21/07/2023	S	1 x HDPE jar	1	X	X							
18	FD03_SS	21/07/2023	S	1 x HDPE jar	1	X								
				TOTAL	6	6	5							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com

☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	◯ Standard TAT (List due date):
OFFICE: Brisbane		☐ Non Standard or urgent TAT (List due date):
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	
ORDER NUMBER:		
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910	
SAMPLER: Brian Llewellyn	SAMPLER MOBILE: 0409 939 243	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to: maria.prskalo@ghd.com		
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com		

COC SEQUENCE NUMBER (Circle)

COC: 1 2 (3) 4 5 6 7

OF: 1 2 3 4 (5) 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
B. Llewellyn	JB		
DATE/TIME: 26.7.23 1300hrs	DATE/TIME: 27/7/23 0800	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP231X PFAS - Full suite (28 analytes)	EP231X (TOP) PFAS - TOPA (28 analytes)							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
16	MW81_DC_0.0-25.0	12/07/2023	S	1 x HDPE jar	1	X	X							
20	MW82_DC_0.0-25.0	13/07/2023	S	1 x HDPE jar	1	X	X							
21	MW83_DC_0.0-37.0	14/07/2023	S	1 x HDPE jar	1	X	X							
22	MW84_DC_0.0-39.0	11/07/2023	S	1 x HDPE jar	1	X	X							
23	MW85_DC_0.0-40.0	19/07/2023	S	1 x HDPE jar	1	X	X							
24	MW86_DC_0.0-37.0	18/07/2023	S	1 x HDPE jar	1	X	X							
25	MW89_DC_0.0-12.5	21/07/2023	S	1 x HDPE jar	1	X	X							
26	MW98_DC_0.0-31.0	18/07/2023	S	1 x HDPE jar	1	X	X							Container is labelled as MW93_DC_0.0-31.0
27	MW94_DC_0.0-25.0	15/07/2023	S	1 x HDPE jar	1	X	X							
28	FD04_DC	21/07/2023	S	1 x HDPE jar	1	X	X							Container is labelled as FD04
29	FD06_DC	13/07/2023	S	1 x HDPE jar	1	X	X							Container is labelled as FD02-1
				TOTAL	11	11	11							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

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CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	◯ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Brisbane		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER:		COC: 1 2 3 (4) 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910	OF: 1 2 3 4 (5) 6 7	Other comment:
SAMPLER: Brian Llewellyn	SAMPLER MOBILE: 0409 939 243	RELINQUISHED BY: B. Llewellyn	RECEIVED BY: JB
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 26.7.23 1300hrs	DATE/TIME: 27/7/23 0800
Email Reports to: maria.prskalo@ghd.com		RELINQUISHED BY:	RECEIVED BY:
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Containers are labelled with _DC_, and should be _WB_

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP231X PFAS - Full suite (28 analytes)	pH	EC	Total organic carbon (TOC)	Metals (Fe, Mn)				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
30	MW83_WB_14.0-19.0	13/07/2023	S	1 x HDPE jar + 1 x glass jar	2	X	X	X	X	X				Place PFAS container on hold, pending additional analysis if needed
31	MW85_WB_9.0-16.0	19/07/2023	S	1 x HDPE jar + 1 x glass jar	2	X	X	X	X	X				Place PFAS container on hold, pending additional analysis if needed
32	MW86_WB_9.0-15.0	18/07/2023	S	1 x HDPE jar + 1 x glass jar	2	X	X	X	X	X				Place PFAS container on hold, pending additional analysis if needed
33	MW89_WB_5.0-11.0	21/07/2023	S	1 x HDPE jar + 1 x glass jar	2	X	X	X	X	X				Place PFAS container on hold, pending additional analysis if needed
34	MW98_WB_6.0-12.0	18/07/2023	S	1 x HDPE jar + 1 x glass jar	2	X	X	X	X	X				Place PFAS container on hold, pending additional analysis if needed
35	MW94_WB_19.0-25.0	15/07/2023	S	1 x HDPE jar + 1 x glass jar	2	X	X	X	X	X				Place PFAS container on hold, pending additional analysis if needed
36	FD05_WB	21/07/2023	S	1 x HDPE jar + 1 x glass jar	2	X	X	X	X	X				Container is labelled as FD05. Place PFAS container on hold, pending additional analysis if needed
	[redacted]													
				TOTAL	14	7	7	7	7	7				

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

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CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	◯ Standard TAT (List due date):	FOR LABORATORY USE ONLY: (Circle)
OFFICE: Brisbane		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice packs present upon receipt? Yes / No / N/A
ORDER NUMBER:		COC: 1 2 3 4 (5) 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910	OF: 1 2 3 4 (5) 6 7	Other comment:
SAMPLER: Brian Llewellyn	SAMPLER MOBILE: 0409 939 243		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):		
Email Reports to: maria.prskalo@ghd.com			
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
B Llewellyn	JTB		
DATE/TIME: 26.7.23 1300hrs	DATE/TIME: 27/7/23 0900	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP231X-SUT PFAS – Super Ultra Trace Full Suite (28 analytes)	EP231X-LL (TOP) PFAS – Low level TOPA (28 analytes)							
37	RS01_SS	11/07/2023	W	2x125mL Grey P, 2x20mL Grey P	5	X	X							
38	RS02_SS	12/07/2023	W	2x125mL Grey P, 2x20mL Grey P	5	X	X							
39	RS03_SS	14/07/2023	W	2x125mL Grey P, 2x20mL Grey P	5	X	X							
40	RS04_SS	15/07/2023	W	2x125mL Grey P, 2x20mL Grey P	5	X	X							
41	RS05_SS	18/07/2023	W	2x125mL Grey P, 2x20mL Grey P	5	X	X							
42	RS06_SS	19/07/2023	W	2x125mL Grey P, 2x20mL Grey P	5	X	X							
43	RS08_SS	21/07/2023	W	2x125mL Grey P, 2x20mL Grey P	5	X	X							
44	FB01_SS	19/07/2023	W	2x125mL Grey P, 2x20mL Grey P	5	X	X							Container labelled as RINS01
45	TB01_SS	25/7/2023	W	2x125mL Grey P, 2x20mL Grey P	5	X	X							
				TOTAL	40	8	8							

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V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2323019**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: maria.prskalo@ghd.com	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 3316 3333	Facsimile	: +61-7-3243 7218
Project	: 12609270	Page	: 1 of 5
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/005)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: BRIAN LLEWELLYN		

Dates

Date Samples Received	: 27-Jul-2023 08:00	Issue Date	: 03-Aug-2023
Client Requested Due Date	: 07-Aug-2023	Scheduled Reporting Date	: **07-Aug-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 10.6°C, 9.5°C - Ice present
Receipt Detail	: Medium Esky	No. of samples received / analysed	: 46 / 45

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please be advised that a number of sample ID discrepancies exist as noted in the Additional Information section of the received Chain of Custody. All sample IDs have been assigned per the Sample ID column. If you would like to discuss this further, please contact Client Services at ALSEnviro.Brisbane@alsglobal.com.**
- **Please be advised that for samples #30 - 36, PFAS analysis has not been assigned per the additional information section of the received Chain of Custody. If you would like to discuss this further, please contact Client Services at ALSEnviro.Brisbane@alsglobal.com.**
- **3/8/23: SRN has been resent to acknowledge additional analysis per Maria Prskalo. Please note that the reporting date has been updated to allow for this change. For any further information regarding these adjustments please contact client services at ALSEnviro.Brisbane@alsglobal.com.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **An extra sample was received labelled as "MW85_DC_25-34m" (ALS # 46) and has been placed on hold. If testing is required on this sample, please contact ALS Client Services at ALSEnviro.Brisbane@alsglobal.com**
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA002 pH (1:5)	SOIL - EA010 (solids): Electrical Conductivity (1:5)	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - EP231X (TOP) (solids) PFAS - Total Oxidisable Precursor (TOP) Assay
EB2323019-001	12-Jul-2023 00:00	MW81_SS_0.45-0.50			✓			✓	✓
EB2323019-002	12-Jul-2023 00:00	MW82_SS_0.35-0.45			✓			✓	✓
EB2323019-003	14-Jul-2023 00:00	MW83_SS_0.20-0.25			✓			✓	✓
EB2323019-004	14-Jul-2023 00:00	MW83_SS_0.50-0.55			✓			✓	
EB2323019-005	11-Jul-2023 00:00	MW84_SS_0.10-0.20			✓			✓	✓
EB2323019-006	19-Jul-2023 00:00	MW85_SS_0.15-0.20			✓			✓	✓
EB2323019-007	19-Jul-2023 00:00	MW85_SS_0.35-0.40			✓			✓	
EB2323019-008	18-Jul-2023 00:00	MW86_SS_0.20-0.25			✓			✓	✓
EB2323019-009	18-Jul-2023 00:00	MW86_SS_0.40-0.45			✓			✓	
EB2323019-010	21-Jul-2023 00:00	MW89_SS_0.20-0.25			✓			✓	✓
EB2323019-011	21-Jul-2023 00:00	MW89_SS_0.50-0.55			✓			✓	
EB2323019-012	18-Jul-2023 00:00	MW98_SS_0.25-0.30			✓			✓	✓
EB2323019-013	18-Jul-2023 00:00	MW98_SS_0.45-0.50			✓			✓	✓
EB2323019-014	15-Jul-2023 00:00	MW94_SS_0.30-0.35			✓			✓	✓
EB2323019-015	15-Jul-2023 00:00	MW94_SS_0.50-0.55			✓			✓	✓
EB2323019-016	12-Jul-2023 00:00	FD01_SS			✓			✓	✓
EB2323019-017	21-Jul-2023 00:00	FD02_SS			✓			✓	✓
EB2323019-018	21-Jul-2023 00:00	FD03_SS			✓			✓	
EB2323019-019	12-Jul-2023 00:00	MW81_DC_0.0-25.0			✓			✓	✓
EB2323019-020	13-Jul-2023 00:00	MW82_DC_0.0-25.0			✓			✓	✓
EB2323019-021	14-Jul-2023 00:00	MW83_DC_0.0-37.0			✓			✓	✓
EB2323019-022	11-Jul-2023 00:00	MW84_DC_0.0-39.0			✓			✓	✓
EB2323019-023	19-Jul-2023 00:00	MW85_DC_0.0-40.0			✓			✓	✓
EB2323019-024	18-Jul-2023 00:00	MW86_DC_0.0-37.0			✓			✓	✓
EB2323019-025	21-Jul-2023 00:00	MW89_DC_0.0-12.5			✓			✓	✓
EB2323019-026	18-Jul-2023 00:00	MW98_DC_0.0-31.0			✓			✓	✓
EB2323019-027	15-Jul-2023 00:00	MW94_DC_0.0-25.0			✓			✓	✓
EB2323019-028	21-Jul-2023 00:00	FD04_DC			✓			✓	✓
EB2323019-029	13-Jul-2023 00:00	FD06_DC			✓			✓	✓
EB2323019-030	13-Jul-2023 00:00	MW83_WB_14.9-19.0	✓	✓	✓	✓	✓	✓	
EB2323019-031	19-Jul-2023 00:00	MW85_WB_9.0-16.0	✓	✓	✓	✓	✓	✓	
EB2323019-032	18-Jul-2023 00:00	MW86_WB_9.0-15.0	✓	✓	✓	✓	✓	✓	
EB2323019-033	21-Jul-2023 00:00	MW89_WB_5.0-11.0	✓	✓	✓	✓	✓	✓	
EB2323019-034	18-Jul-2023 00:00	MW98_WB_6.0-12.0	✓	✓	✓	✓	✓	✓	
EB2323019-035	15-Jul-2023 00:00	MW94_WB_19.0-25.0	✓	✓	✓	✓	✓	✓	

			SOIL - EA002 pH (1:5)	SOIL - EA010 (solids): Electrical Conductivity (1:5)	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - EP231X (TOP) (solids) PFAS - Total Oxidisable Precursor (TOP) Assay
EB2323019-036	21-Jul-2023 00:00	FD05_WB	✓	✓	✓	✓	✓	✓	

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	(On Hold) SOIL No analysis requested
EB2323019-046	19-Jul-2023 00:00	MW85_DC_25-34m	✓

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X-LL (TOP) PFAS - Total Oxidisable Precursor (TOP) Assay -	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29
EB2323019-037	11-Jul-2023 00:00	RS01_SS	✓	✓
EB2323019-038	12-Jul-2023 00:00	RS02_SS	✓	✓
EB2323019-039	14-Jul-2023 00:00	RS03_SS	✓	✓
EB2323019-040	15-Jul-2023 00:00	RS04_SS	✓	✓
EB2323019-041	18-Jul-2023 00:00	RS05_SS	✓	✓
EB2323019-042	19-Jul-2023 00:00	RS06_SS	✓	✓
EB2323019-043	21-Jul-2023 00:00	RS08_SS	✓	✓
EB2323019-044	19-Jul-2023 00:00	FB01_SS	✓	✓
EB2323019-045	25-Jul-2023 00:00	TB01_SS	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA002: pH (1:5)							
MW83_WB_14.9-19.0	Soil Glass Jar - Unpreserved	20-Jul-2023	01-Aug-2023	27-Jul-2023	×	----	----
MW85_WB_9.0-16.0	Soil Glass Jar - Unpreserved	26-Jul-2023	01-Aug-2023	27-Jul-2023	×	----	----
MW86_WB_9.0-15.0	Soil Glass Jar - Unpreserved	25-Jul-2023	01-Aug-2023	27-Jul-2023	×	----	----
MW94_WB_19.0-25.0	Soil Glass Jar - Unpreserved	22-Jul-2023	01-Aug-2023	27-Jul-2023	×	----	----
MW98_WB_6.0-12.0	Soil Glass Jar - Unpreserved	25-Jul-2023	01-Aug-2023	27-Jul-2023	×	----	----
EA010: Electrical Conductivity (1:5)							
MW83_WB_14.9-19.0	Soil Glass Jar - Unpreserved	20-Jul-2023	29-Aug-2023	27-Jul-2023	×	----	----
MW85_WB_9.0-16.0	Soil Glass Jar - Unpreserved	26-Jul-2023	29-Aug-2023	27-Jul-2023	×	----	----
MW86_WB_9.0-15.0	Soil Glass Jar - Unpreserved	25-Jul-2023	29-Aug-2023	27-Jul-2023	×	----	----
MW94_WB_19.0-25.0	Soil Glass Jar - Unpreserved	22-Jul-2023	29-Aug-2023	27-Jul-2023	×	----	----
MW98_WB_6.0-12.0	Soil Glass Jar - Unpreserved	25-Jul-2023	29-Aug-2023	27-Jul-2023	×	----	----
EA055: Moisture Content							
FD01_SS	HDPE Soil Jar	----	26-Jul-2023	27-Jul-2023	×	----	----
MW81_DC_0.0-25.0	HDPE Soil Jar	----	26-Jul-2023	27-Jul-2023	×	----	----
MW81_SS_0.45-0.50	HDPE Soil Jar	----	26-Jul-2023	27-Jul-2023	×	----	----
MW82_SS_0.35-0.45	HDPE Soil Jar	----	26-Jul-2023	27-Jul-2023	×	----	----
MW84_DC_0.0-39.0	HDPE Soil Jar	----	25-Jul-2023	27-Jul-2023	×	----	----
MW84_SS_0.10-0.20	HDPE Soil Jar	----	25-Jul-2023	27-Jul-2023	×	----	----

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

MARIA PRSKALO

- *AU Certificate of Analysis - NATA (COA)	Email	maria.prskalo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	maria.prskalo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	maria.prskalo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	maria.prskalo@ghd.com
- A4 - AU Tax Invoice (INV)	Email	maria.prskalo@ghd.com
- Chain of Custody (CoC) (COC)	Email	maria.prskalo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	maria.prskalo@ghd.com
- EDI Format - XTab (XTAB)	Email	maria.prskalo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	maria.prskalo@ghd.com

CERTIFICATE OF ANALYSIS

Work Order	: **EB2323019**	Page	: 1 of 41
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 27-Jul-2023 08:00
Order number	: ----	Date Analysis Commenced	: 31-Jul-2023
C-O-C number	: ----	Issue Date	: 07-Aug-2023 16:53
Sampler	: BRIAN LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 46		
No. of samples analysed	: 45		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Acid Sulphate Soils, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X PFAS: Sample 'MW81_SS_0.45-0.50' (EB2323019_001) shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): MW83_WB_14.9-19.0 (EB2323019-030) shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EP231X (TOP) PFAS TOPA: Sample "MW84_DC_0.0-39.0"(EB2323019-022) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EP231X (TOP) PFAS TOPA: The LOR of PFOS for samples "MW82_SS_0.35-0.45"(EB2323019-002), "MW83_SS_0.20-0.25"(EB2323019-003), & "FD01_SS"(EB2323019-016) has been raised due to matrix interferences.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW81_SS_0.45-0.50	MW82_SS_0.35-0.45	MW83_SS_0.20-0.25	MW83_SS_0.50-0.55	MW84_SS_0.10-0.20
				Sampling date / time	12-Jul-2023 00:00	12-Jul-2023 00:00	14-Jul-2023 00:00	14-Jul-2023 00:00	11-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-001	EB2323019-002	EB2323019-003	EB2323019-004	EB2323019-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**16.8**	**16.9**	**10.5**	**10.0**	**21.2**
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	**0.0003**	<0.0002	----	**0.0005**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0008**	<0.0002	<0.0002	----	**0.0003**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0069**	<0.0008	<0.0010	----	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	----	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0005**	<0.0002	<0.0002	----	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0013**	<0.0002	**0.0007**	----	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	<0.0005
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW81_SS_0.45-0.50	MW82_SS_0.35-0.45	MW83_SS_0.20-0.25	MW83_SS_0.50-0.55	MW84_SS_0.10-0.20
				Sampling date / time	12-Jul-2023 00:00	12-Jul-2023 00:00	14-Jul-2023 00:00	14-Jul-2023 00:00	11-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-001	EB2323019-002	EB2323019-003	EB2323019-004	EB2323019-005
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	<0.0002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	<0.0005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0095**	**0.0003**	**0.0007**	----	**0.0008**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0077**	<0.0002	<0.0002	----	**0.0003**
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		**0.0095**	**0.0003**	**0.0007**	----	**0.0008**
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		**0.0061**	<0.0002	**0.0005**	----	**0.0005**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0006**	<0.0002	**0.0002**	<0.0002	**0.0004**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW81_SS_0.45-0.50	MW82_SS_0.35-0.45	MW83_SS_0.20-0.25	MW83_SS_0.50-0.55	MW84_SS_0.10-0.20
				Sampling date / time	12-Jul-2023 00:00	12-Jul-2023 00:00	14-Jul-2023 00:00	14-Jul-2023 00:00	11-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-001	EB2323019-002	EB2323019-003	EB2323019-004	EB2323019-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0051**	**0.0006**	**0.0007**	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0010**	<0.0002	**0.0006**	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW81_SS_0.45-0.50	MW82_SS_0.35-0.45	MW83_SS_0.20-0.25	MW83_SS_0.50-0.55	MW84_SS_0.10-0.20
				Sampling date / time	12-Jul-2023 00:00	12-Jul-2023 00:00	14-Jul-2023 00:00	14-Jul-2023 00:00	11-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-001	EB2323019-002	EB2323019-003	EB2323019-004	EB2323019-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0071**	**0.0006**	**0.0015**	<0.0002	**0.0007**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0057**	**0.0006**	**0.0009**	<0.0002	**0.0004**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0071**	**0.0006**	**0.0015**	<0.0002	**0.0007**
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**80.3**	**89.2**	**96.6**	**----**	**68.2**
13C8-PFOA	----	0.0002	%		**80.8**	**81.9**	**66.7**	**----**	**86.6**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.5**	**97.5**	**112**	**102**	**104**
13C8-PFOA	----	0.0002	%		**106**	**97.0**	**105**	**106**	**110**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW85_SS_0.15-0.20	MW85_SS_0.35-0.40	MW86_SS_0.20-0.25	MW86_SS_0.40-0.45	MW89_SS_0.20-0.25
				Sampling date / time	19-Jul-2023 00:00	19-Jul-2023 00:00	18-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-006	EB2323019-007	EB2323019-008	EB2323019-009	EB2323019-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**12.6**	**6.9**	**14.8**	**16.4**	**17.6**
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	<0.001	----	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	<0.0005	----	<0.0005
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	<0.0005	----	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW85_SS_0.15-0.20	MW85_SS_0.35-0.40	MW86_SS_0.20-0.25	MW86_SS_0.40-0.45	MW89_SS_0.20-0.25
				Sampling date / time	19-Jul-2023 00:00	19-Jul-2023 00:00	18-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-006	EB2323019-007	EB2323019-008	EB2323019-009	EB2323019-010
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	<0.0005	----	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	<0.0005	----	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	<0.0005	----	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	<0.0005	----	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	<0.0005	----	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	<0.0005	----	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	<0.0005	----	<0.0005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		<0.0002	----	<0.0002	----	<0.0002
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW85_SS_0.15-0.20	MW85_SS_0.35-0.40	MW86_SS_0.20-0.25	MW86_SS_0.40-0.45	MW89_SS_0.20-0.25
				Sampling date / time	19-Jul-2023 00:00	19-Jul-2023 00:00	18-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-006	EB2323019-007	EB2323019-008	EB2323019-009	EB2323019-010
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW85_SS_0.15-0.20	MW85_SS_0.35-0.40	MW86_SS_0.20-0.25	MW86_SS_0.40-0.45	MW89_SS_0.20-0.25
				Sampling date / time	19-Jul-2023 00:00	19-Jul-2023 00:00	18-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-006	EB2323019-007	EB2323019-008	EB2323019-009	EB2323019-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**88.7**	**----**	**81.4**	**----**	**83.5**
13C8-PFOA	----	0.0002	%		**78.8**	**----**	**77.7**	**----**	**80.8**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	**99.5**	**102**	**99.5**	**104**
13C8-PFOA	----	0.0002	%		**103**	**102**	**106**	**100**	**104**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	MW89_SS_0.50-0.55	MW98_SS_0.25-0.30	MW98_SS_0.45-0.50	MW94_SS_0.30-0.35	MW94_SS_0.50-0.55
			Sampling date / time	21-Jul-2023 00:00	18-Jul-2023 00:00	18-Jul-2023 00:00	15-Jul-2023 00:00	15-Jul-2023 00:00
Compound	CAS Number	LOR	Unit	EB2323019-011	EB2323019-012	EB2323019-013	EB2323019-014	EB2323019-015
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**17.0**	**12.0**	**6.8**	**10.3**	**10.4**
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	----	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	----	<0.0005	<0.0005	<0.0005	<0.0005
EP231_TOP_C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	----	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	----	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW89_SS_0.50-0.55	MW98_SS_0.25-0.30	MW98_SS_0.45-0.50	MW94_SS_0.30-0.35	MW94_SS_0.50-0.55
				Sampling date / time	21-Jul-2023 00:00	18-Jul-2023 00:00	18-Jul-2023 00:00	15-Jul-2023 00:00	15-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-011	EB2323019-012	EB2323019-013	EB2323019-014	EB2323019-015
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		----	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		----	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		----	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		----	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		----	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		----	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		----	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		----	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		----	<0.0005	<0.0005	<0.0005	<0.0005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		----	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		----	<0.0002	<0.0002	<0.0002	<0.0002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		----	<0.0002	<0.0002	<0.0002	<0.0002
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		----	<0.0002	<0.0002	<0.0002	<0.0002
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW89_SS_0.50-0.55	MW98_SS_0.25-0.30	MW98_SS_0.45-0.50	MW94_SS_0.30-0.35	MW94_SS_0.50-0.55
				Sampling date / time	21-Jul-2023 00:00	18-Jul-2023 00:00	18-Jul-2023 00:00	15-Jul-2023 00:00	15-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-011	EB2323019-012	EB2323019-013	EB2323019-014	EB2323019-015
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW89_SS_0.50-0.55	MW98_SS_0.25-0.30	MW98_SS_0.45-0.50	MW94_SS_0.30-0.35	MW94_SS_0.50-0.55
				Sampling date / time	21-Jul-2023 00:00	18-Jul-2023 00:00	18-Jul-2023 00:00	15-Jul-2023 00:00	15-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-011	EB2323019-012	EB2323019-013	EB2323019-014	EB2323019-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		----	97.6	92.9	88.2	87.7
13C8-PFOA	----	0.0002	%		----	85.6	77.7	74.6	84.5
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		102	104	98.0	102	101
13C8-PFOA	----	0.0002	%		103	103	106	106	102

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FD01_SS	FD02_SS	FD03_SS	MW81_DC_0.0-25.0	MW82_DC_0.0-25.0
				Sampling date / time	12-Jul-2023 00:00	21-Jul-2023 00:00	21-Jul-2023 00:00	12-Jul-2023 00:00	13-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-016	EB2323019-017	EB2323019-018	EB2323019-019	EB2323019-020
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**16.6**	**16.6**	**16.4**	**9.2**	**7.7**
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0008	<0.0002	----	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	----	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	----	<0.0005	<0.0005
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	----	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FD01_SS	FD02_SS	FD03_SS	MW81_DC_0.0-25.0	MW82_DC_0.0-25.0
				Sampling date / time	12-Jul-2023 00:00	21-Jul-2023 00:00	21-Jul-2023 00:00	12-Jul-2023 00:00	13-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-016	EB2323019-017	EB2323019-018	EB2323019-019	EB2323019-020
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	----	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	----	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	----	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	----	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	<0.0005	<0.0005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		<0.0002	<0.0002	----	<0.0002	<0.0002
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FD01_SS	FD02_SS	FD03_SS	MW81_DC_0.0-25.0	MW82_DC_0.0-25.0
				Sampling date / time	12-Jul-2023 00:00	21-Jul-2023 00:00	21-Jul-2023 00:00	12-Jul-2023 00:00	13-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-016	EB2323019-017	EB2323019-018	EB2323019-019	EB2323019-020
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FD01_SS	FD02_SS	FD03_SS	MW81_DC_0.0-25.0	MW82_DC_0.0-25.0
				Sampling date / time	12-Jul-2023 00:00	21-Jul-2023 00:00	21-Jul-2023 00:00	12-Jul-2023 00:00	13-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-016	EB2323019-017	EB2323019-018	EB2323019-019	EB2323019-020
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**80.3**	**89.8**	**----**	**89.2**	**88.7**
13C8-PFOA	----	0.0002	%		**89.8**	**85.0**	**----**	**89.8**	**87.2**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**97.0**	**110**	**98.5**	**106**	**104**
13C8-PFOA	----	0.0002	%		**108**	**103**	**104**	**104**	**105**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW83_DC_0.0-37.0	MW84_DC_0.0-39.0	MW85_DC_0.0-40.0	MW86_DC_0.0-37.0	MW89_DC_0.0-12.5
				Sampling date / time	14-Jul-2023 00:00	11-Jul-2023 00:00	19-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-021	EB2323019-022	EB2323019-023	EB2323019-024	EB2323019-025
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**7.4**	**8.0**	**5.4**	**2.8**	**5.2**
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	**0.0005**	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	**0.0007**	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0039**	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	**0.0029**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0012**	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW83_DC_0.0-37.0	MW84_DC_0.0-39.0	MW85_DC_0.0-40.0	MW86_DC_0.0-37.0	MW89_DC_0.0-12.5
				Sampling date / time	14-Jul-2023 00:00	11-Jul-2023 00:00	19-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-021	EB2323019-022	EB2323019-023	EB2323019-024	EB2323019-025
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	**0.0096**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0068**	<0.0002	<0.0002	<0.0002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		<0.0002	**0.0096**	<0.0002	<0.0002	<0.0002
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		<0.0002	**0.0060**	<0.0002	<0.0002	<0.0002
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	**0.0006**	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0044**	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW83_DC_0.0-37.0	MW84_DC_0.0-39.0	MW85_DC_0.0-40.0	MW86_DC_0.0-37.0	MW89_DC_0.0-12.5
				Sampling date / time	14-Jul-2023 00:00	11-Jul-2023 00:00	19-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-021	EB2323019-022	EB2323019-023	EB2323019-024	EB2323019-025
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	**0.0040**	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0010**	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW83_DC_0.0-37.0	MW84_DC_0.0-39.0	MW85_DC_0.0-40.0	MW86_DC_0.0-37.0	MW89_DC_0.0-12.5
				Sampling date / time	14-Jul-2023 00:00	11-Jul-2023 00:00	19-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-021	EB2323019-022	EB2323019-023	EB2323019-024	EB2323019-025
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	**0.0110**	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0084**	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	**0.0102**	<0.0002	<0.0002	<0.0002
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**93.4**	**90.3**	**117**	**106**	**100**
13C8-PFOA	----	0.0002	%		**94.0**	**103**	**90.8**	**98.2**	**95.6**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**97.0**	**105**	**86.5**	**85.5**	**110**
13C8-PFOA	----	0.0002	%		**114**	**115**	**119**	**117**	**124**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	MW98_DC_0.0-31.0	MW94_DC_0.0-25.0	FD04_DC	FD06_DC	MW83_WB_14.9-19.0
			Sampling date / time	18-Jul-2023 00:00	15-Jul-2023 00:00	21-Jul-2023 00:00	13-Jul-2023 00:00	13-Jul-2023 00:00
Compound	CAS Number	LOR	Unit	EB2323019-026	EB2323019-027	EB2323019-028	EB2323019-029	EB2323019-030
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	----	----	----	----	9.2
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	----	----	275
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	1.0	7.4	5.4	10.0	9.3
EG005(ED093)T: Total Metals by ICP-AES								
Iron	7439-89-6	50	mg/kg	----	----	----	----	23400
Manganese	7439-96-5	5	mg/kg	----	----	----	----	412
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	----	----	----	----	0.04
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW98_DC_0.0-31.0	MW94_DC_0.0-25.0	FD04_DC	FD06_DC	MW83_WB_14.9-19.0
				Sampling date / time	18-Jul-2023 00:00	15-Jul-2023 00:00	21-Jul-2023 00:00	13-Jul-2023 00:00	13-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-026	EB2323019-027	EB2323019-028	EB2323019-029	EB2323019-030
					Result	Result	Result	Result	Result
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW98_DC_0.0-31.0	MW94_DC_0.0-25.0	FD04_DC	FD06_DC	MW83_WB_14.9-19.0
				Sampling date / time	18-Jul-2023 00:00	15-Jul-2023 00:00	21-Jul-2023 00:00	13-Jul-2023 00:00	13-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-026	EB2323019-027	EB2323019-028	EB2323019-029	EB2323019-030
					Result	Result	Result	Result	Result
EP231_TOP_P: PFAS Sums - Continued									
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW98_DC_0.0-31.0	MW94_DC_0.0-25.0	FD04_DC	FD06_DC	MW83_WB_14.9-19.0
				Sampling date / time	18-Jul-2023 00:00	15-Jul-2023 00:00	21-Jul-2023 00:00	13-Jul-2023 00:00	13-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-026	EB2323019-027	EB2323019-028	EB2323019-029	EB2323019-030
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**96.1**	**109**	**100**	**89.8**	**----**
13C8-PFOA	----	0.0002	%		**97.1**	**99.8**	**100**	**102**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**87.0**	**105**	**107**	**106**	**100**
13C8-PFOA	----	0.0002	%		**106**	**121**	**114**	**113**	**110**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	MW85_WB_9.0-16.0	MW86_WB_9.0-15.0	MW89_WB_5.0-11.0	MW98_WB_6.0-12.0	MW94_WB_19.0-25.0
			Sampling date / time	19-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00	18-Jul-2023 00:00	15-Jul-2023 00:00
Compound	CAS Number	LOR	Unit	EB2323019-031	EB2323019-032	EB2323019-033	EB2323019-034	EB2323019-035
				Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	9.3	10.0	9.2	9.8	9.1
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	121	270	250	182	558
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	0.2	2.2	3.3	0.8	14.4
EG005(ED093)T: Total Metals by ICP-AES								
Iron	7439-89-6	50	mg/kg	27600	15700	2890	8790	16200
Manganese	7439-96-5	5	mg/kg	661	446	299	537	450
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	0.05	0.06	0.07	0.06	0.06
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW85_WB_9.0-16.0	MW86_WB_9.0-15.0	MW89_WB_5.0-11.0	MW98_WB_6.0-12.0	MW94_WB_19.0-25.0
				Sampling date / time	19-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00	18-Jul-2023 00:00	15-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-031	EB2323019-032	EB2323019-033	EB2323019-034	EB2323019-035
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW85_WB_9.0-16.0	MW86_WB_9.0-15.0	MW89_WB_5.0-11.0	MW98_WB_6.0-12.0	MW94_WB_19.0-25.0
				Sampling date / time	19-Jul-2023 00:00	18-Jul-2023 00:00	21-Jul-2023 00:00	18-Jul-2023 00:00	15-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-031	EB2323019-032	EB2323019-033	EB2323019-034	EB2323019-035
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**112**	**118**	**76.5**	**80.5**	**79.5**
13C8-PFOA	----	0.0002	%		**114**	**109**	**90.0**	**110**	**110**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FD05_WB	----	----	----	----
				Sampling date / time	21-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323019-036	--------	--------	--------	--------
					Result	----	----	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		**9.2**	----	----	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		**238**	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**3.6**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Iron	7439-89-6	50	mg/kg		**2940**	----	----	----	----
Manganese	7439-96-5	5	mg/kg		**373**	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		**0.07**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FD05_WB	----	----	----	----
				Sampling date / time	21-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323019-036	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FD05_WB	----	----	----	----
				Sampling date / time	21-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2323019-036	--------	--------	--------	--------
					Result	----	----	----	----
EP231P: PFAS Sums - Continued									
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	**----**	**----**	**----**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**106**	**----**	**----**	**----**	**----**
13C8-PFOA	----	0.0002	%		**109**	**----**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS01_SS	RS02_SS	RS03_SS	RS04_SS	RS05_SS
				Sampling date / time	11-Jul-2023 00:00	12-Jul-2023 00:00	14-Jul-2023 00:00	15-Jul-2023 00:00	18-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-037	EB2323019-038	EB2323019-039	EB2323019-040	EB2323019-041
					Result	Result	Result	Result	Result
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS01_SS	RS02_SS	RS03_SS	RS04_SS	RS05_SS
				Sampling date / time	11-Jul-2023 00:00	12-Jul-2023 00:00	14-Jul-2023 00:00	15-Jul-2023 00:00	18-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-037	EB2323019-038	EB2323019-039	EB2323019-040	EB2323019-041
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
^ Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS01_SS	RS02_SS	RS03_SS	RS04_SS	RS05_SS
				Sampling date / time	11-Jul-2023 00:00	12-Jul-2023 00:00	14-Jul-2023 00:00	15-Jul-2023 00:00	18-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-037	EB2323019-038	EB2323019-039	EB2323019-040	EB2323019-041
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS01_SS	RS02_SS	RS03_SS	RS04_SS	RS05_SS
				Sampling date / time	11-Jul-2023 00:00	12-Jul-2023 00:00	14-Jul-2023 00:00	15-Jul-2023 00:00	18-Jul-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323019-037	EB2323019-038	EB2323019-039	EB2323019-040	EB2323019-041
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
^ **Sum of PFHxS and PFOS**	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ **Sum of PFAS (WA DER List)**	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
^ **Sum of PFAS**	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**84.1**	**96.3**	**77.5**	**85.8**	**97.4**
13C8-PFOA	----	0.002	%		**89.5**	**98.7**	**83.1**	**90.4**	**104**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**99.0**	**99.9**	**99.3**	**102**	**104**
13C8-PFOA	----	0.0005	%		**91.9**	**96.4**	**94.5**	**96.9**	**93.4**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS06_SS	RS08_SS	FB01_SS	TB01_SS	----
				Sampling date / time	19-Jul-2023 00:00	21-Jul-2023 00:00	19-Jul-2023 00:00	25-Jul-2023 00:00	----
Compound	CAS Number	LOR	Unit		EB2323019-042	EB2323019-043	EB2323019-044	EB2323019-045	--------
					Result	Result	Result	Result	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS06_SS	RS08_SS	FB01_SS	TB01_SS	----
				Sampling date / time	19-Jul-2023 00:00	21-Jul-2023 00:00	19-Jul-2023 00:00	25-Jul-2023 00:00	----
Compound	CAS Number	LOR	Unit		EB2323019-042	EB2323019-043	EB2323019-044	EB2323019-045	--------
					Result	Result	Result	Result	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
^ Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS06_SS	RS08_SS	FB01_SS	TB01_SS	----
				Sampling date / time	19-Jul-2023 00:00	21-Jul-2023 00:00	19-Jul-2023 00:00	25-Jul-2023 00:00	----
Compound	CAS Number	LOR	Unit		EB2323019-042	EB2323019-043	EB2323019-044	EB2323019-045	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0020	<0.0020	<0.0020	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RS06_SS	RS08_SS	FB01_SS	TB01_SS	----
				Sampling date / time	19-Jul-2023 00:00	21-Jul-2023 00:00	19-Jul-2023 00:00	25-Jul-2023 00:00	----
Compound	CAS Number	LOR	Unit		EB2323019-042	EB2323019-043	EB2323019-044	EB2323019-045	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	<0.001	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	----
^ Sum of PFAS	----	0.0002	µg/L		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**93.2**	**108**	**99.3**	**84.7**	----
13C8-PFOA	----	0.002	%		**95.8**	**109**	**103**	**87.9**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**105**	**97.7**	**102**	**104**	----
13C8-PFOA	----	0.0005	%		**91.9**	**93.8**	**96.5**	**93.4**	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	47	129
13C8-PFOA	----	56	128
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	34	137
13C8-PFOA	----	56	129
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EB2323019**	Page	: 1 of 24
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 27-Jul-2023
Order number	: ----	Date Analysis Commenced	: 31-Jul-2023
C-O-C number	: ----	Issue Date	: 07-Aug-2023
Sampler	: BRIAN LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 46		
No. of samples analysed	: 45		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Acid Sulphate Soils, Stafford, QLD
Beatriz Llarinas	Senior Chemist - Inorganics	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5203805)									
EB2323019-030	MW83_WB_14.9-19.0	EG005T: Manganese	7439-96-5	5	mg/kg	412	# 551	28.7	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	23400	24800	5.7	0% - 20%
EA002: pH 1:5 (Soils) (QC Lot: 5203806)									
EB2322638-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	8.8	8.9	0.0	0% - 20%
EB2323019-030	MW83_WB_14.9-19.0	EA002: pH Value	----	0.1	pH Unit	9.2	9.1	0.0	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 5203807)									
EB2322638-001	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	286	274	4.2	0% - 20%
EB2323019-030	MW83_WB_14.9-19.0	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	275	312	12.7	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5203808)									
EB2322638-001	Anonymous	EA055: Moisture Content	----	0.1	%	9.2	9.3	0.0	0% - 20%
EB2323019-031	MW85_WB_9.0-16.0	EA055: Moisture Content	----	0.1	%	0.2	0.3	0.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5203814)									
EB2323019-001	MW81_SS_0.45-0.50	EA055: Moisture Content	----	0.1	%	16.8	16.7	0.0	0% - 20%
EB2323019-011	MW89_SS_0.50-0.55	EA055: Moisture Content	----	0.1	%	17.0	16.7	1.5	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5203817)									
EB2323019-021	MW83_DC_0.0-37.0	EA055: Moisture Content	----	0.1	%	7.4	7.4	0.0	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 5207082)									
EB2322705-003	Anonymous	EP003: Total Organic Carbon	----	0.02	%	6.28	6.42	2.3	0% - 20%
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5203812)									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0008	0.0007	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5203812) - continued									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0069	0.0062	10.3	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2323019-015	MW94_SS_0.50-0.55	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5203816)									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5203812)									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0005	0.0004	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0013	0.0011	11.6	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2323019-015	MW94_SS_0.50-0.55	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5203816)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5203816) - continued									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 5203812)									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2323019-015	MW94_SS_0.50-0.55	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 5203816)									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 5203816) - continued									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5203812)									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2323019-015	MW94_SS_0.50-0.55	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5203816)									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 5203812)									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0095	0.0084	12.3	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231_TOP_P: PFAS Sums (QC Lot: 5203812) - continued									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0077	0.0069	11.0	0% - 20%
		EP231X: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	0.0095	0.0084	12.3	0% - 20%
		EP231X: Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg	0.0061	0.0054	12.3	0% - 20%
EB2323019-015	MW94_SS_0.50-0.55	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 5203816)									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5203813)									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0006	0.0004	34.8	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0051	# 0.0035	36.9	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2323019-011	MW89_SS_0.50-0.55	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5203815)									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5212862)									
EB2323019-030	MW83_WB_14.9-19.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5212862) - continued									
EB2323019-030	MW83_WB_14.9-19.0	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2323019-036	FD05_WB	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5203813)									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0004	<0.0002	57.1	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0010	0.0005	61.7	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2323019-011	MW89_SS_0.50-0.55	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5203815)									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5203815) - continued									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5212862)									
EB2323019-030	MW83_WB_14.9-19.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2323019-036	FD05_WB	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5203813)									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5203813) - continued									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2323019-011	MW89_SS_0.50-0.55	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5203815)									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5212862)									
EB2323019-030	MW83_WB_14.9-19.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5212862) - continued									
EB2323019-030	MW83_WB_14.9-19.0	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2323019-036	FD05_WB	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5203813)									
EB2323019-001	MW81_SS_0.45-0.50	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2323019-011	MW89_SS_0.50-0.55	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5203815)									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5203815) - continued									
EB2323019-021	MW83_DC_0.0-37.0	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5212862)									
EB2323019-030	MW83_WB_14.9-19.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2323019-036	FD05_WB	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5202768)									
EB2323019-037	RS01_SS	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	<0.002	0.0	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5202768)									
EB2323019-037	RS01_SS	EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	<0.002	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5202768) - continued									
EB2323019-037	RS01_SS	EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 5202768)									
EB2323019-037	RS01_SS	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	<0.005	0.0	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5202768)									
EB2323019-037	RS01_SS	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	<0.005	0.0	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 5202768)									
EB2323019-037	RS01_SS	EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	<0.002	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5203805)								
EG005T: Iron	7439-89-6	50	mg/kg	<50	29321.7553 mg/kg	91.4	70.0	120
EG005T: Manganese	7439-96-5	5	mg/kg	<5	438.8374 mg/kg	106	84.0	113
EA002: pH 1:5 (Soils) (QCLot: 5203806)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	101	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA010: Conductivity (1:5) (QCLot: 5203807)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	101	97.0	103
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 5207082)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	0.55 %	97.9	80.0	120
				<0.02	32.3 %	99.7	80.0	120
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5203812)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00237 mg/kg	85.7	43.5	125
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00232 mg/kg	96.8	36.6	118
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5203816)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00237 mg/kg	82.4	43.5	125
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00232 mg/kg	84.8	36.6	118
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5203812)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	82.7	41.4	126

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5203812) - continued								
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5203816)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	85.0	41.4	126
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5203812)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5203816)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	----	----	----	----

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5203816) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5203812)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00018 mg/kg	0.0	0	200
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5203816)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00018 mg/kg	0.0	0	200
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5203813)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	113	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	111	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	105	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	113	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	108	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	106	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5203815)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	126	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	120	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	95.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	116	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	112	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	118	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5212862)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	108	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	106	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	83.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	80.2	70.0	132

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5212862) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	77.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	81.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5203813)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	103	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5203815)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	85.7	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	118	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	124	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	123	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	130	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	116	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5212862)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	91.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5212862) - continued								
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5203813)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5203815)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	119	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	117	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	111	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5212862)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.0	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.3	61.9	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5212862) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5203813)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	110	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	113	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	107	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	95.4	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5203815)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	106	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	130	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	116	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	105	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5212862)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	94.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	120	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	121	54.8	124

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5202768)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.475 µg/L	109	44.9	136
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.465 µg/L	103	33.2	116
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5202768)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	----	----	----	----
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.5 µg/L	109	47.0	123

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5202768) - continued								
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5202768)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5202768)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.0476 µg/L	-0.6	0	200
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_P: PFAS Sums (QCLot: 5202768)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5202782)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	112	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	102	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	105	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	108	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5202782) - continued								
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	107	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	109	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5202782)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	126	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	125	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	128	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	105	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	124	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	104	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	129	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	106	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	76.0	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	86.8	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	122	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5202782)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	115	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	95.5	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	105	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	103	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	134	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	98.4	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	134	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5202782)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	117	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	96.0	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	132	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	132	53.1	133
EP231P: PFAS Sums (QCLot: 5202782)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5202782) - continued								
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5203813)							
EB2323019-002	MW82_SS_0.35-0.45	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	121	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	123	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	112	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	124	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	126	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	120	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5203815)							
EB2323019-022	MW84_DC_0.0-39.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	124	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	106	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	# 12.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	121	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	110	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5212862)							
EB2323019-031	MW85_WB_9.0-16.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	109	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	106	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	84.3	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	87.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	97.4	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	107	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5203813)							
EB2323019-002	MW82_SS_0.35-0.45	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	113	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	123	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	118	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	116	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	116	69.0	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5203813) - continued							
EB2323019-002	MW82_SS_0.35-0.45	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	126	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	122	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	118	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	124	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	132	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	117	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5203815)							
EB2323019-022	MW84_DC_0.0-39.0	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	94.5	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	106	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	103	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	117	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	125	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	124	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	116	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	122	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	121	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	132	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	128	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5212862)							
EB2323019-031	MW85_WB_9.0-16.0	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	101	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	103	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	103	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	103	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	118	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	104	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	114	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	100	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	118	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	109	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	110	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5203813)							
EB2323019-002	MW82_SS_0.35-0.45	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	122	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	121	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	111	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	121	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5203813) - continued							
EB2323019-002	MW82_SS_0.35-0.45	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	122	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	97.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	137	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5203815)							
EB2323019-022	MW84_DC_0.0-39.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	120	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	122	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	121	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	130	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	124	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	112	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	116	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5212862)							
EB2323019-031	MW85_WB_9.0-16.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	106	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	112	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	98.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	121	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	99.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	120	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	98.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5203813)							
EB2323019-002	MW82_SS_0.35-0.45	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	117	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	122	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	126	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	113	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5203815)							
EB2323019-022	MW84_DC_0.0-39.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	142	62.0	145

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5203815) - continued							
EB2323019-022	MW84_DC_0.0-39.0	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	137	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	131	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	124	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5212862)							
EB2323019-031	MW85_WB_9.0-16.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	93.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	120	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	119	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	126	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2323019**	Page	: 1 of 23
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 27-Jul-2023
Site	:	Issue Date	: 07-Aug-2023
Sampler	: BRIAN LLEWELLYN	No. of samples received	: 46
Order number	: ----	No. of samples analysed	: 45

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	EB2323019--030	MW83_WB_14.9-19.0	**Manganese**	7439-96-5	28.7 %	0% - 20%	**RPD exceeds LOR based limits**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2323019--001	MW81_SS_0.45-0.50	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	36.9 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2323019--022	MW84_DC_0.0-39.0	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	12.7 %	67.0-130%	**Recovery less than lower data quality objective**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA002: pH 1:5 (Soils)						
HDPE Soil Jar						
FD05_WB	01-Aug-2023	28-Jul-2023	**4**	----	----	----
Soil Glass Jar - Unpreserved						
MW83_WB_14.9-19.0	01-Aug-2023	20-Jul-2023	**12**	----	----	----
Soil Glass Jar - Unpreserved						
MW94_WB_19.0-25.0	01-Aug-2023	22-Jul-2023	**10**	----	----	----
Soil Glass Jar - Unpreserved						
MW86_WB_9.0-15.0, MW98_WB_6.0-12.0	01-Aug-2023	25-Jul-2023	**7**	----	----	----
Soil Glass Jar - Unpreserved						
MW85_WB_9.0-16.0	01-Aug-2023	26-Jul-2023	**6**	----	----	----
Soil Glass Jar - Unpreserved						
MW89_WB_5.0-11.0	01-Aug-2023	28-Jul-2023	**4**	----	----	----
EA010: Conductivity (1:5)						
HDPE Soil Jar						
FD05_WB	01-Aug-2023	28-Jul-2023	**4**	----	----	----
Soil Glass Jar - Unpreserved						
MW83_WB_14.9-19.0	01-Aug-2023	20-Jul-2023	**12**	----	----	----
Soil Glass Jar - Unpreserved						
MW94_WB_19.0-25.0	01-Aug-2023	22-Jul-2023	**10**	----	----	----
Soil Glass Jar - Unpreserved						
MW86_WB_9.0-15.0, MW98_WB_6.0-12.0	01-Aug-2023	25-Jul-2023	**7**	----	----	----
Soil Glass Jar - Unpreserved						
MW85_WB_9.0-16.0	01-Aug-2023	26-Jul-2023	**6**	----	----	----
Soil Glass Jar - Unpreserved						
MW89_WB_5.0-11.0	01-Aug-2023	28-Jul-2023	**4**	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)						

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA055: Moisture Content (Dried @ 105-110°C) - Analysis Holding Time Compliance						
HDPE Soil Jar MW84_SS_0.10-0.20, MW84_DC_0.0-39.0	----	----	----	31-Jul-2023	25-Jul-2023	**6**
HDPE Soil Jar MW81_SS_0.45-0.50, MW82_SS_0.35-0.45, FD01_SS, MW81_DC_0.0-25.0	----	----	----	31-Jul-2023	26-Jul-2023	**5**
HDPE Soil Jar MW82_DC_0.0-25.0, FD06_DC	----	----	----	31-Jul-2023	27-Jul-2023	**4**
HDPE Soil Jar MW83_SS_0.20-0.25, MW83_SS_0.50-0.55, MW83_DC_0.0-37.0	----	----	----	31-Jul-2023	28-Jul-2023	**3**
HDPE Soil Jar MW94_SS_0.30-0.35, MW94_SS_0.50-0.55, MW94_DC_0.0-25.0	----	----	----	31-Jul-2023	29-Jul-2023	**2**
Soil Glass Jar - Unpreserved MW83_WB_14.9-19.0	----	----	----	31-Jul-2023	27-Jul-2023	**4**
Soil Glass Jar - Unpreserved MW94_WB_19.0-25.0	----	----	----	31-Jul-2023	29-Jul-2023	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Matrix Spikes (MS)					
Total Metals by ICP-AES	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	12	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	12	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA002: pH 1:5 (Soils)							
HDPE Soil Jar (EA002) FD05_WB	**21-Jul-2023**	**01-Aug-2023**	28-Jul-2023	×	**01-Aug-2023**	01-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA002) MW83_WB_14.9-19.0	**13-Jul-2023**	**01-Aug-2023**	20-Jul-2023	×	**01-Aug-2023**	01-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA002) MW94_WB_19.0-25.0	**15-Jul-2023**	**01-Aug-2023**	22-Jul-2023	×	**01-Aug-2023**	01-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA002) MW86_WB_9.0-15.0, MW98_WB_6.0-12.0	**18-Jul-2023**	**01-Aug-2023**	25-Jul-2023	×	**01-Aug-2023**	01-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA002) MW85_WB_9.0-16.0	**19-Jul-2023**	**01-Aug-2023**	26-Jul-2023	×	**01-Aug-2023**	01-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA002) MW89_WB_5.0-11.0	**21-Jul-2023**	**01-Aug-2023**	28-Jul-2023	×	**01-Aug-2023**	01-Aug-2023	✓
EA010: Conductivity (1:5)							
HDPE Soil Jar (EA010) FD05_WB	**21-Jul-2023**	**01-Aug-2023**	28-Jul-2023	×	**01-Aug-2023**	29-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA010) MW83_WB_14.9-19.0	**13-Jul-2023**	**01-Aug-2023**	20-Jul-2023	×	**01-Aug-2023**	29-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA010) MW94_WB_19.0-25.0	**15-Jul-2023**	**01-Aug-2023**	22-Jul-2023	×	**01-Aug-2023**	29-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA010) MW86_WB_9.0-15.0, MW98_WB_6.0-12.0	**18-Jul-2023**	**01-Aug-2023**	25-Jul-2023	×	**01-Aug-2023**	29-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA010) MW85_WB_9.0-16.0	**19-Jul-2023**	**01-Aug-2023**	26-Jul-2023	×	**01-Aug-2023**	29-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA010) MW89_WB_5.0-11.0	**21-Jul-2023**	**01-Aug-2023**	28-Jul-2023	×	**01-Aug-2023**	29-Aug-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) MW84_SS_0.10-0.20, MW84_DC_0.0-39.0	**11-Jul-2023**	**----**	----	----	**31-Jul-2023**	25-Jul-2023	×
HDPE Soil Jar (EA055) MW81_SS_0.45-0.50, MW82_SS_0.35-0.45, FD01_SS, MW81_DC_0.0-25.0	**12-Jul-2023**	**----**	----	----	**31-Jul-2023**	26-Jul-2023	×
HDPE Soil Jar (EA055) MW82_DC_0.0-25.0, FD06_DC	**13-Jul-2023**	**----**	----	----	**31-Jul-2023**	27-Jul-2023	×
HDPE Soil Jar (EA055) MW83_SS_0.20-0.25, MW83_SS_0.50-0.55, MW83_DC_0.0-37.0	**14-Jul-2023**	**----**	----	----	**31-Jul-2023**	28-Jul-2023	×
HDPE Soil Jar (EA055) MW94_SS_0.30-0.35, MW94_SS_0.50-0.55, MW94_DC_0.0-25.0	**15-Jul-2023**	**----**	----	----	**31-Jul-2023**	29-Jul-2023	×
HDPE Soil Jar (EA055) MW86_SS_0.20-0.25, MW86_SS_0.40-0.45, MW98_SS_0.25-0.30, MW98_SS_0.45-0.50, MW86_DC_0.0-37.0, MW98_DC_0.0-31.0	**18-Jul-2023**	**----**	----	----	**31-Jul-2023**	01-Aug-2023	✓
HDPE Soil Jar (EA055) MW85_SS_0.15-0.20, MW85_SS_0.35-0.40, MW85_DC_0.0-40.0	**19-Jul-2023**	**----**	----	----	**31-Jul-2023**	02-Aug-2023	✓
HDPE Soil Jar (EA055) MW89_SS_0.20-0.25, MW89_SS_0.50-0.55, FD02_SS, FD03_SS, MW89_DC_0.0-12.5, FD04_DC, FD05_WB	**21-Jul-2023**	**----**	----	----	**31-Jul-2023**	04-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA055) MW83_WB_14.9-19.0	**13-Jul-2023**	**----**	----	----	**31-Jul-2023**	27-Jul-2023	×
Soil Glass Jar - Unpreserved (EA055) MW94_WB_19.0-25.0	**15-Jul-2023**	**----**	----	----	**31-Jul-2023**	29-Jul-2023	×
Soil Glass Jar - Unpreserved (EA055) MW86_WB_9.0-15.0, MW98_WB_6.0-12.0	**18-Jul-2023**	**----**	----	----	**31-Jul-2023**	01-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA055) MW85_WB_9.0-16.0	**19-Jul-2023**	**----**	----	----	**31-Jul-2023**	02-Aug-2023	✓
Soil Glass Jar - Unpreserved (EA055) MW89_WB_5.0-11.0	**21-Jul-2023**	**----**	----	----	**31-Jul-2023**	04-Aug-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005(ED093)T: Total Metals by ICP-AES							
HDPE Soil Jar (EG005T) FD05_WB	**21-Jul-2023**	**01-Aug-2023**	17-Jan-2024	✓	**01-Aug-2023**	17-Jan-2024	✓
Soil Glass Jar - Unpreserved (EG005T) MW83_WB_14.9-19.0	**13-Jul-2023**	**01-Aug-2023**	09-Jan-2024	✓	**01-Aug-2023**	09-Jan-2024	✓
Soil Glass Jar - Unpreserved (EG005T) MW94_WB_19.0-25.0	**15-Jul-2023**	**01-Aug-2023**	11-Jan-2024	✓	**01-Aug-2023**	11-Jan-2024	✓
Soil Glass Jar - Unpreserved (EG005T) MW86_WB_9.0-15.0, MW98_WB_6.0-12.0	**18-Jul-2023**	**01-Aug-2023**	14-Jan-2024	✓	**01-Aug-2023**	14-Jan-2024	✓
Soil Glass Jar - Unpreserved (EG005T) MW85_WB_9.0-16.0	**19-Jul-2023**	**01-Aug-2023**	15-Jan-2024	✓	**01-Aug-2023**	15-Jan-2024	✓
Soil Glass Jar - Unpreserved (EG005T) MW89_WB_5.0-11.0	**21-Jul-2023**	**01-Aug-2023**	17-Jan-2024	✓	**01-Aug-2023**	17-Jan-2024	✓
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003) MW83_WB_14.9-19.0	**13-Jul-2023**	**01-Aug-2023**	10-Aug-2023	✓	**02-Aug-2023**	10-Aug-2023	✓
Pulp Bag (EP003) MW94_WB_19.0-25.0	**15-Jul-2023**	**01-Aug-2023**	12-Aug-2023	✓	**02-Aug-2023**	12-Aug-2023	✓
Pulp Bag (EP003) MW86_WB_9.0-15.0, MW98_WB_6.0-12.0	**18-Jul-2023**	**01-Aug-2023**	15-Aug-2023	✓	**02-Aug-2023**	15-Aug-2023	✓
Pulp Bag (EP003) MW85_WB_9.0-16.0	**19-Jul-2023**	**01-Aug-2023**	16-Aug-2023	✓	**02-Aug-2023**	16-Aug-2023	✓
Pulp Bag (EP003) MW89_WB_5.0-11.0, FD05_WB	**21-Jul-2023**	**01-Aug-2023**	18-Aug-2023	✓	**02-Aug-2023**	18-Aug-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X (TOP))								
MW84_SS_0.10-0.20,	MW84_DC_0.0-39.0	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW81_SS_0.45-0.50,	MW82_SS_0.35-0.45,	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
FD01_SS,	MW81_DC_0.0-25.0							
HDPE Soil Jar (EP231X (TOP))								
MW82_DC_0.0-25.0,	FD06_DC	**13-Jul-2023**	**31-Jul-2023**	09-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW83_SS_0.20-0.25,	MW83_DC_0.0-37.0	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW94_SS_0.30-0.35,	MW94_SS_0.50-0.55,	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW94_DC_0.0-25.0								
HDPE Soil Jar (EP231X (TOP))								
MW86_SS_0.20-0.25,	MW98_SS_0.25-0.30,	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW98_SS_0.45-0.50,	MW86_DC_0.0-37.0,							
MW98_DC_0.0-31.0								
HDPE Soil Jar (EP231X (TOP))								
MW85_SS_0.15-0.20,	MW85_DC_0.0-40.0	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW89_SS_0.20-0.25,	FD02_SS,	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW89_DC_0.0-12.5,	FD04_DC							
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X (TOP))								
MW84_SS_0.10-0.20,	MW84_DC_0.0-39.0	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW81_SS_0.45-0.50,	MW82_SS_0.35-0.45,	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
FD01_SS,	MW81_DC_0.0-25.0							
HDPE Soil Jar (EP231X (TOP))								
MW82_DC_0.0-25.0,	FD06_DC	**13-Jul-2023**	**31-Jul-2023**	09-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW83_SS_0.20-0.25,	MW83_DC_0.0-37.0	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW94_SS_0.30-0.35,	MW94_SS_0.50-0.55,	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW94_DC_0.0-25.0								
HDPE Soil Jar (EP231X (TOP))								
MW86_SS_0.20-0.25,	MW98_SS_0.25-0.30,	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW98_SS_0.45-0.50,	MW86_DC_0.0-37.0,							
MW98_DC_0.0-31.0								
HDPE Soil Jar (EP231X (TOP))								
MW85_SS_0.15-0.20,	MW85_DC_0.0-40.0	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW89_SS_0.20-0.25,	FD02_SS,	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW89_DC_0.0-12.5,	FD04_DC							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X (TOP))								
MW84_SS_0.10-0.20,	MW84_DC_0.0-39.0	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW81_SS_0.45-0.50,	MW82_SS_0.35-0.45,	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
FD01_SS,	MW81_DC_0.0-25.0							
HDPE Soil Jar (EP231X (TOP))								
MW82_DC_0.0-25.0,	FD06_DC	**13-Jul-2023**	**31-Jul-2023**	09-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW83_SS_0.20-0.25,	MW83_DC_0.0-37.0	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW94_SS_0.30-0.35,	MW94_SS_0.50-0.55,	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW94_DC_0.0-25.0								
HDPE Soil Jar (EP231X (TOP))								
MW86_SS_0.20-0.25,	MW98_SS_0.25-0.30,	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW98_SS_0.45-0.50,	MW86_DC_0.0-37.0,							
MW98_DC_0.0-31.0								
HDPE Soil Jar (EP231X (TOP))								
MW85_SS_0.15-0.20,	MW85_DC_0.0-40.0	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW89_SS_0.20-0.25,	FD02_SS,	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW89_DC_0.0-12.5,	FD04_DC							
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X (TOP))								
MW84_SS_0.10-0.20,	MW84_DC_0.0-39.0	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW81_SS_0.45-0.50,	MW82_SS_0.35-0.45,	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
FD01_SS,	MW81_DC_0.0-25.0							
HDPE Soil Jar (EP231X (TOP))								
MW82_DC_0.0-25.0,	FD06_DC	**13-Jul-2023**	**31-Jul-2023**	09-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW83_SS_0.20-0.25,	MW83_DC_0.0-37.0	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW94_SS_0.30-0.35,	MW94_SS_0.50-0.55,	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW94_DC_0.0-25.0								
HDPE Soil Jar (EP231X (TOP))								
MW86_SS_0.20-0.25,	MW98_SS_0.25-0.30,	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW98_SS_0.45-0.50,	MW86_DC_0.0-37.0,							
MW98_DC_0.0-31.0								
HDPE Soil Jar (EP231X (TOP))								
MW85_SS_0.15-0.20,	MW85_DC_0.0-40.0	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW89_SS_0.20-0.25,	FD02_SS,	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
MW89_DC_0.0-12.5,	FD04_DC							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_P: PFAS Sums							
HDPE Soil Jar (EP231X (TOP)) MW84_SS_0.10-0.20, MW84_DC_0.0-39.0	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW81_SS_0.45-0.50, MW82_SS_0.35-0.45, FD01_SS, MW81_DC_0.0-25.0	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW82_DC_0.0-25.0, FD06_DC	**13-Jul-2023**	**31-Jul-2023**	09-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW83_SS_0.20-0.25, MW83_DC_0.0-37.0	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW94_SS_0.30-0.35, MW94_SS_0.50-0.55, MW94_DC_0.0-25.0	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW86_SS_0.20-0.25, MW98_SS_0.25-0.30, MW98_SS_0.45-0.50, MW86_DC_0.0-37.0, MW98_DC_0.0-31.0	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW85_SS_0.15-0.20, MW85_DC_0.0-40.0	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW89_SS_0.20-0.25, FD02_SS, MW89_DC_0.0-12.5, FD04_DC	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) MW84_SS_0.10-0.20,	MW84_DC_0.0-39.0	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW81_SS_0.45-0.50, FD01_SS,	MW82_SS_0.35-0.45, MW81_DC_0.0-25.0	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW83_WB_14.9-19.0		**13-Jul-2023**	**03-Aug-2023**	09-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW82_DC_0.0-25.0,	FD06_DC	**13-Jul-2023**	**31-Jul-2023**	09-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW83_SS_0.20-0.25, MW83_DC_0.0-37.0	MW83_SS_0.50-0.55,	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW94_WB_19.0-25.0		**15-Jul-2023**	**03-Aug-2023**	11-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW94_SS_0.30-0.35, MW94_DC_0.0-25.0	MW94_SS_0.50-0.55,	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW86_WB_9.0-15.0,	MW98_WB_6.0-12.0	**18-Jul-2023**	**03-Aug-2023**	14-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW86_SS_0.20-0.25, MW98_SS_0.25-0.30, MW86_DC_0.0-37.0,	MW86_SS_0.40-0.45, MW98_SS_0.45-0.50, MW98_DC_0.0-31.0	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW85_WB_9.0-16.0		**19-Jul-2023**	**03-Aug-2023**	15-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW85_SS_0.15-0.20, MW85_DC_0.0-40.0	MW85_SS_0.35-0.40,	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW89_WB_5.0-11.0,	FD05_WB	**21-Jul-2023**	**03-Aug-2023**	17-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW89_SS_0.20-0.25, FD02_SS, MW89_DC_0.0-12.5,	MW89_SS_0.50-0.55, FD03_SS, FD04_DC	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) MW84_SS_0.10-0.20,	MW84_DC_0.0-39.0	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW81_SS_0.45-0.50, FD01_SS,	MW82_SS_0.35-0.45, MW81_DC_0.0-25.0	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW83_WB_14.9-19.0		**13-Jul-2023**	**03-Aug-2023**	09-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW82_DC_0.0-25.0,	FD06_DC	**13-Jul-2023**	**31-Jul-2023**	09-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW83_SS_0.20-0.25, MW83_DC_0.0-37.0	MW83_SS_0.50-0.55,	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW94_WB_19.0-25.0		**15-Jul-2023**	**03-Aug-2023**	11-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW94_SS_0.30-0.35, MW94_DC_0.0-25.0	MW94_SS_0.50-0.55,	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW86_WB_9.0-15.0,	MW98_WB_6.0-12.0	**18-Jul-2023**	**03-Aug-2023**	14-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW86_SS_0.20-0.25, MW98_SS_0.25-0.30, MW86_DC_0.0-37.0,	MW86_SS_0.40-0.45, MW98_SS_0.45-0.50, MW98_DC_0.0-31.0	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW85_WB_9.0-16.0		**19-Jul-2023**	**03-Aug-2023**	15-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW85_SS_0.15-0.20, MW85_DC_0.0-40.0	MW85_SS_0.35-0.40,	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW89_WB_5.0-11.0,	FD05_WB	**21-Jul-2023**	**03-Aug-2023**	17-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW89_SS_0.20-0.25, FD02_SS, MW89_DC_0.0-12.5,	MW89_SS_0.50-0.55, FD03_SS, FD04_DC	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) MW84_SS_0.10-0.20,	MW84_DC_0.0-39.0	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW81_SS_0.45-0.50, FD01_SS,	MW82_SS_0.35-0.45, MW81_DC_0.0-25.0	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW83_WB_14.9-19.0		**13-Jul-2023**	**03-Aug-2023**	09-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW82_DC_0.0-25.0,	FD06_DC	**13-Jul-2023**	**31-Jul-2023**	09-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW83_SS_0.20-0.25, MW83_DC_0.0-37.0	MW83_SS_0.50-0.55,	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW94_WB_19.0-25.0		**15-Jul-2023**	**03-Aug-2023**	11-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW94_SS_0.30-0.35, MW94_DC_0.0-25.0	MW94_SS_0.50-0.55,	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW86_WB_9.0-15.0,	MW98_WB_6.0-12.0	**18-Jul-2023**	**03-Aug-2023**	14-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW86_SS_0.20-0.25, MW98_SS_0.25-0.30, MW86_DC_0.0-37.0,	MW86_SS_0.40-0.45, MW98_SS_0.45-0.50, MW98_DC_0.0-31.0	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW85_WB_9.0-16.0		**19-Jul-2023**	**03-Aug-2023**	15-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW85_SS_0.15-0.20, MW85_DC_0.0-40.0	MW85_SS_0.35-0.40,	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW89_WB_5.0-11.0,	FD05_WB	**21-Jul-2023**	**03-Aug-2023**	17-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW89_SS_0.20-0.25, FD02_SS, MW89_DC_0.0-12.5,	MW89_SS_0.50-0.55, FD03_SS, FD04_DC	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) MW84_SS_0.10-0.20,	MW84_DC_0.0-39.0	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW81_SS_0.45-0.50, FD01_SS,	MW82_SS_0.35-0.45, MW81_DC_0.0-25.0	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW83_WB_14.9-19.0		**13-Jul-2023**	**03-Aug-2023**	09-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW82_DC_0.0-25.0,	FD06_DC	**13-Jul-2023**	**31-Jul-2023**	09-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW83_SS_0.20-0.25, MW83_DC_0.0-37.0	MW83_SS_0.50-0.55,	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW94_WB_19.0-25.0		**15-Jul-2023**	**03-Aug-2023**	11-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW94_SS_0.30-0.35, MW94_DC_0.0-25.0	MW94_SS_0.50-0.55,	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW86_WB_9.0-15.0,	MW98_WB_6.0-12.0	**18-Jul-2023**	**03-Aug-2023**	14-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW86_SS_0.20-0.25, MW98_SS_0.25-0.30, MW86_DC_0.0-37.0,	MW86_SS_0.40-0.45, MW98_SS_0.45-0.50, MW98_DC_0.0-31.0	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW85_WB_9.0-16.0		**19-Jul-2023**	**03-Aug-2023**	15-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW85_SS_0.15-0.20, MW85_DC_0.0-40.0	MW85_SS_0.35-0.40,	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW89_WB_5.0-11.0,	FD05_WB	**21-Jul-2023**	**03-Aug-2023**	17-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW89_SS_0.20-0.25, FD02_SS, MW89_DC_0.0-12.5,	MW89_SS_0.50-0.55, FD03_SS, FD04_DC	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) MW84_SS_0.10-0.20, MW84_DC_0.0-39.0	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW81_SS_0.45-0.50, MW82_SS_0.35-0.45, FD01_SS, MW81_DC_0.0-25.0	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW83_WB_14.9-19.0	**13-Jul-2023**	**03-Aug-2023**	09-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW82_DC_0.0-25.0, FD06_DC	**13-Jul-2023**	**31-Jul-2023**	09-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW83_SS_0.20-0.25, MW83_SS_0.50-0.55, MW83_DC_0.0-37.0	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW94_WB_19.0-25.0	**15-Jul-2023**	**03-Aug-2023**	11-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW94_SS_0.30-0.35, MW94_SS_0.50-0.55, MW94_DC_0.0-25.0	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW86_WB_9.0-15.0, MW98_WB_6.0-12.0	**18-Jul-2023**	**03-Aug-2023**	14-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW86_SS_0.20-0.25, MW86_SS_0.40-0.45, MW98_SS_0.25-0.30, MW98_SS_0.45-0.50, MW86_DC_0.0-37.0, MW98_DC_0.0-31.0	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW85_WB_9.0-16.0	**19-Jul-2023**	**03-Aug-2023**	15-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW85_SS_0.15-0.20, MW85_SS_0.35-0.40, MW85_DC_0.0-40.0	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓
HDPE Soil Jar (EP231X) MW89_WB_5.0-11.0, FD05_WB	**21-Jul-2023**	**03-Aug-2023**	17-Jan-2024	✓	**07-Aug-2023**	12-Sep-2023	✓
HDPE Soil Jar (EP231X) MW89_SS_0.20-0.25, MW89_SS_0.50-0.55, FD02_SS, FD03_SS, MW89_DC_0.0-12.5, FD04_DC	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	09-Sep-2023	✓

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) RS01_SS	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	07-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS02_SS	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	08-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS03_SS	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	10-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS04_SS	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	11-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS05_SS	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	14-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS06_SS, FB01_SS	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	15-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS08_SS	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	17-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) TB01_SS	**25-Jul-2023**	**31-Jul-2023**	21-Jan-2024	✓	**03-Aug-2023**	21-Jan-2024	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) RS01_SS	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	07-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS02_SS	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	08-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS03_SS	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	10-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS04_SS	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	11-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS05_SS	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	14-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS06_SS, FB01_SS	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	15-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS08_SS	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	17-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) TB01_SS	**25-Jul-2023**	**31-Jul-2023**	21-Jan-2024	✓	**03-Aug-2023**	21-Jan-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL (TOP)) RS01_SS	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	07-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS02_SS	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	08-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS03_SS	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	10-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS04_SS	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	11-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS05_SS	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	14-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS06_SS, FB01_SS	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	15-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS08_SS	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	17-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) TB01_SS	**25-Jul-2023**	**31-Jul-2023**	21-Jan-2024	✓	**03-Aug-2023**	21-Jan-2024	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) RS01_SS	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	07-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS02_SS	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	08-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS03_SS	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	10-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS04_SS	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	11-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS05_SS	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	14-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS06_SS, FB01_SS	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	15-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS08_SS	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	17-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) TB01_SS	**25-Jul-2023**	**31-Jul-2023**	21-Jan-2024	✓	**03-Aug-2023**	21-Jan-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_P: PFAS Sums							
HDPE (no PTFE) (EP231X-LL (TOP)) RS01_SS	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	07-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS02_SS	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	08-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS03_SS	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	10-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS04_SS	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	11-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS05_SS	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	14-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS06_SS, FB01_SS	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	15-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) RS08_SS	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	17-Jan-2024	✓
HDPE (no PTFE) (EP231X-LL (TOP)) TB01_SS	**25-Jul-2023**	**31-Jul-2023**	21-Jan-2024	✓	**03-Aug-2023**	21-Jan-2024	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) RS01_SS	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	07-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS02_SS	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	08-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS03_SS	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	10-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS04_SS	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	11-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS05_SS	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	14-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS06_SS, FB01_SS	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	15-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS08_SS	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	17-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) TB01_SS	**25-Jul-2023**	**31-Jul-2023**	21-Jan-2024	✓	**03-Aug-2023**	21-Jan-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) RS01_SS	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	07-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS02_SS	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	08-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS03_SS	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	10-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS04_SS	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	11-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS05_SS	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	14-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS06_SS, FB01_SS	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	15-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS08_SS	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	17-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) TB01_SS	**25-Jul-2023**	**31-Jul-2023**	21-Jan-2024	✓	**03-Aug-2023**	21-Jan-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) RS01_SS	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	07-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS02_SS	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	08-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS03_SS	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	10-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS04_SS	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	11-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS05_SS	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	14-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS06_SS, FB01_SS	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	15-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS08_SS	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	17-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) TB01_SS	**25-Jul-2023**	**31-Jul-2023**	21-Jan-2024	✓	**03-Aug-2023**	21-Jan-2024	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) RS01_SS	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	07-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS02_SS	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	08-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS03_SS	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	10-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS04_SS	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	11-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS05_SS	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	14-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS06_SS, FB01_SS	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	15-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS08_SS	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	17-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) TB01_SS	**25-Jul-2023**	**31-Jul-2023**	21-Jan-2024	✓	**03-Aug-2023**	21-Jan-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) RS01_SS	**11-Jul-2023**	**31-Jul-2023**	07-Jan-2024	✓	**03-Aug-2023**	07-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS02_SS	**12-Jul-2023**	**31-Jul-2023**	08-Jan-2024	✓	**03-Aug-2023**	08-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS03_SS	**14-Jul-2023**	**31-Jul-2023**	10-Jan-2024	✓	**03-Aug-2023**	10-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS04_SS	**15-Jul-2023**	**31-Jul-2023**	11-Jan-2024	✓	**03-Aug-2023**	11-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS05_SS	**18-Jul-2023**	**31-Jul-2023**	14-Jan-2024	✓	**03-Aug-2023**	14-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS06_SS, FB01_SS	**19-Jul-2023**	**31-Jul-2023**	15-Jan-2024	✓	**03-Aug-2023**	15-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) RS08_SS	**21-Jul-2023**	**31-Jul-2023**	17-Jan-2024	✓	**03-Aug-2023**	17-Jan-2024	✓
HDPE (no PTFE) (EP231X-SUT) TB01_SS	**25-Jul-2023**	**31-Jul-2023**	21-Jan-2024	✓	**03-Aug-2023**	21-Jan-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Electrical Conductivity (1:5)	EA010	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	5	45	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	40	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	3	24	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Electrical Conductivity (1:5)	EA010	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Electrical Conductivity (1:5)	EA010	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	0	7	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	12	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	12	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Organic Carbon	EP003	SOIL	In house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automatically measured by infra-red detector.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	SOIL	In house, following oxidation per Houtz,Erika F.; Sedlak,David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349.: A portion of the oxidised sample is mixed with methanol (1:1) prior to analysis by LC-Electrospray-MS-MS,Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349. Sample extracts are analysed by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
TOP Digest for PFAS on soil extract.	ORG70-S	SOIL	In-House Extraction followed by digestion with oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342-9349. A soil extract is taken to near dryness and made up to 5 mL with reagents. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Total Oxidisable Precuror Digest for PFAS - Low Level	* ORG70-SPE	WATER	In-House SPE followed by oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349: A 50 mL sample is concentrated by SPE, taken to near dryness and made up to 5 mL in a reagent solution. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

Environmental Division Brisbane
Work Order Reference
EB2323963

Telephone : - 61-7-3243 7222

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR L
OFFICE: Brisbane		☐ Non Standard or urgent TAT (List due date):	Custody
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	COC SEQUENCE NUMBER (Circle)	Free ice receipt?
ORDER NUMBER:		COC: (1) 2 3 4 5 6 7	Random
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910	OF: 1 2 3 (4) 5 6 7	Other c
SAMPLER: Brian Llewellyn	SAMPLER MOBILE: 0409 939 243	RELINQUISHED BY: B Llewellyn	RECEIVED BY: EH
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 3.8.23 1040	DATE/TIME: 04.08.23 0910
Email Reports to: maria.prskalo@ghd.com			RELINQUISI
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com			DATE/TIME:

N/A
N/A

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP231X PFAS - Full suite (28 analytes)	EP231X (TOP) PFAS - TOPA (28 analytes)							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MW90_SS_0.10-0.20	27/07/2023	S	1 x HDPE jar	1	X	X							
2	MW90_SS_0.40-0.50	27/07/2023	S	1 x HDPE jar	1	X								Place PFAS container on hold, pending additional analysis if needed
3	MW91_SS_0.15-0.20	26/07/2023	S	1 x HDPE jar	1	X	X							
4	MW91_SS_0.45-0.50	26/07/2023	S	1 x HDPE jar	1	X								Place PFAS container on hold, pending additional analysis if needed
5	TB02_SS	3.8.23		1 x HDPE jar	1	X								
				TOTAL	5	4	2							

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2323963**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: maria.prskalo@ghd.com	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 3316 3333	Facsimile	: +61-7-3243 7218
Project	: 12609270	Page	: 1 of 2
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/005)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: BRIAN LLEWELLYN		

Dates

Date Samples Received	: 04-Aug-2023 09:10	Issue Date	: 08-Aug-2023
Client Requested Due Date	: 15-Aug-2023	Scheduled Reporting Date	: **15-Aug-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 12.1°C - Ice Bricks present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - EP231X (TOP) (solids) PFAS - Total Oxidisable Precursor (TOP) Assay
EB2323963-001	27-Jul-2023 00:00	MW90_SS_0.10-0.20	✓	✓	✓
EB2323963-002	27-Jul-2023 00:00	MW90_SS_0.40-0.50	✓	✓	
EB2323963-003	26-Jul-2023 00:00	MW91_SS_0.15-0.20	✓	✓	✓
EB2323963-004	26-Jul-2023 00:00	MW91_SS_0.45-0.50	✓	✓	
EB2323963-005	03-Aug-2023 00:00	TB02_SS	✓	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

MARIA PRSKALO

- *AU Certificate of Analysis - NATA (COA)	Email	maria.prskalo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	maria.prskalo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	maria.prskalo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	maria.prskalo@ghd.com
- A4 - AU Tax Invoice (INV)	Email	maria.prskalo@ghd.com
- Chain of Custody (CoC) (COC)	Email	maria.prskalo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	maria.prskalo@ghd.com
- EDI Format - XTab (XTAB)	Email	maria.prskalo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	maria.prskalo@ghd.com

CERTIFICATE OF ANALYSIS

Work Order	: **EB2323963**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023 09:10
Order number	: ----	Date Analysis Commenced	: 08-Aug-2023
C-O-C number	: ----	Issue Date	: 14-Aug-2023 16:06
Sampler	: BRIAN LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW90_SS_0.10-0.20	MW90_SS_0.40-0.50	MW91_SS_0.15-0.20	MW91_SS_0.45-0.50	TB02_SS
				Sampling date / time	27-Jul-2023 00:00	27-Jul-2023 00:00	26-Jul-2023 00:00	26-Jul-2023 00:00	03-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323963-001	EB2323963-002	EB2323963-003	EB2323963-004	EB2323963-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**15.9**	**16.3**	**18.0**	**14.4**	**17.4**
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	<0.0005	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW90_SS_0.10-0.20	MW90_SS_0.40-0.50	MW91_SS_0.15-0.20	MW91_SS_0.45-0.50	TB02_SS
				Sampling date / time	27-Jul-2023 00:00	27-Jul-2023 00:00	26-Jul-2023 00:00	26-Jul-2023 00:00	03-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323963-001	EB2323963-002	EB2323963-003	EB2323963-004	EB2323963-005
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	<0.0005	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		<0.0002	----	<0.0002	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW90_SS_0.10-0.20	MW90_SS_0.40-0.50	MW91_SS_0.15-0.20	MW91_SS_0.45-0.50	TB02_SS
				Sampling date / time	27-Jul-2023 00:00	27-Jul-2023 00:00	26-Jul-2023 00:00	26-Jul-2023 00:00	03-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323963-001	EB2323963-002	EB2323963-003	EB2323963-004	EB2323963-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW90_SS_0.10-0.20	MW90_SS_0.40-0.50	MW91_SS_0.15-0.20	MW91_SS_0.45-0.50	TB02_SS
				Sampling date / time	27-Jul-2023 00:00	27-Jul-2023 00:00	26-Jul-2023 00:00	26-Jul-2023 00:00	03-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EB2323963-001	EB2323963-002	EB2323963-003	EB2323963-004	EB2323963-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	**----**	**97.1**	**----**	**----**
13C8-PFOA	----	0.0002	%		**97.6**	**----**	**88.7**	**----**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**100**	**98.0**	**96.5**	**79.5**	**112**
13C8-PFOA	----	0.0002	%		**104**	**106**	**105**	**112**	**105**

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	47	129
13C8-PFOA	----	56	128
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EB2323963**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023
Order number	: ----	Date Analysis Commenced	: 08-Aug-2023
C-O-C number	: ----	Issue Date	: 14-Aug-2023
Sampler	: BRIAN LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 5		
No. of samples analysed	: 5		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5221743)									
EB2323764-002	Anonymous	EA055: Moisture Content	----	0.1	%	9.9	9.7	1.6	0% - 20%
EB2324147-003	Anonymous	EA055: Moisture Content	----	0.1	%	14.5	14.5	0.0	0% - 20%
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5221742)									
EB2323963-001	MW90_SS_0.10-0.20	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5221742)									
EB2323963-001	MW90_SS_0.10-0.20	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 5221742)									
EB2323963-001	MW90_SS_0.10-0.20	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 5221742) - continued									
EB2323963-001	MW90_SS_0.10-0.20	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5221742)									
EB2323963-001	MW90_SS_0.10-0.20	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 5221742)									
EB2323963-001	MW90_SS_0.10-0.20	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5221739)									
EB2323963-001	MW90_SS_0.10-0.20	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2324149-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5221739) - continued									
EB2324149-002	Anonymous	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5221739)									
EB2323963-001	MW90_SS_0.10-0.20	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2324149-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5221739)									
EB2323963-001	MW90_SS_0.10-0.20	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2324149-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5221739) - continued									
EB2324149-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5221739)									
EB2323963-001	MW90_SS_0.10-0.20	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2324149-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5221742)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00237 mg/kg	93.5	43.5	125
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00232 mg/kg	88.0	36.6	118
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221742)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	95.1	41.4	126
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5221742)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221742)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221742) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00018 mg/kg	0.0	0	200
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5221739)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	90.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	97.9	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	86.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	94.1	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	105	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	86.7	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221739)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	86.9	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.5	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221739)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	61.0	139

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221739)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	95.7	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	96.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	110	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	102	54.8	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5221739)							
EB2323963-002	MW90_SS_0.40-0.50	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	95.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	104	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	86.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	102	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	101	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	91.7	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221739)							
EB2323963-002	MW90_SS_0.40-0.50	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	78.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	91.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	102	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	114	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	96.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	118	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	103	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221739)							
EB2323963-002	MW90_SS_0.40-0.50	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	100	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	96.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	111	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221739) - continued							
EB2323963-002	MW90_SS_0.40-0.50	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	98.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	116	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221739)							
EB2323963-002	MW90_SS_0.40-0.50	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	112	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	130	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	100	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2323963**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023
Site	:	Issue Date	: 14-Aug-2023
Sampler	: BRIAN LLEWELLYN	No. of samples received	: 5
Order number	: ----	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) TB02_SS	**03-Aug-2023**	**----**	----	----	**08-Aug-2023**	17-Aug-2023	✓
HDPE Soil Jar (EA055) MW91_SS_0.15-0.20, MW91_SS_0.45-0.50	**26-Jul-2023**	**----**	----	----	**08-Aug-2023**	09-Aug-2023	✓
HDPE Soil Jar (EA055) MW90_SS_0.10-0.20, MW90_SS_0.40-0.50	**27-Jul-2023**	**----**	----	----	**08-Aug-2023**	10-Aug-2023	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X (TOP)) MW91_SS_0.15-0.20	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW90_SS_0.10-0.20	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X (TOP)) MW91_SS_0.15-0.20	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW90_SS_0.10-0.20	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X (TOP)) MW91_SS_0.15-0.20	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW90_SS_0.10-0.20	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X (TOP)) MW91_SS_0.15-0.20	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW90_SS_0.10-0.20	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
EP231_TOP_P: PFAS Sums							
HDPE Soil Jar (EP231X (TOP)) MW91_SS_0.15-0.20	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP)) MW90_SS_0.10-0.20	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) TB02_SS	**03-Aug-2023**	**09-Aug-2023**	30-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW91_SS_0.15-0.20, MW91_SS_0.45-0.50	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_SS_0.10-0.20, MW90_SS_0.40-0.50	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) TB02_SS	**03-Aug-2023**	**09-Aug-2023**	30-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW91_SS_0.15-0.20, MW91_SS_0.45-0.50	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_SS_0.10-0.20, MW90_SS_0.40-0.50	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) TB02_SS	**03-Aug-2023**	**09-Aug-2023**	30-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW91_SS_0.15-0.20, MW91_SS_0.45-0.50	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_SS_0.10-0.20, MW90_SS_0.40-0.50	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) TB02_SS	**03-Aug-2023**	**09-Aug-2023**	30-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW91_SS_0.15-0.20, MW91_SS_0.45-0.50	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_SS_0.10-0.20, MW90_SS_0.40-0.50	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) TB02_SS	**03-Aug-2023**	**09-Aug-2023**	30-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW91_SS_0.15-0.20, MW91_SS_0.45-0.50	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_SS_0.10-0.20, MW90_SS_0.40-0.50	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	SOIL	In house, following oxidation per Houtz,Erika F.; Sedlak,David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349.: A portion of the oxidised sample is mixed with methanol (1:1) prior to analysis by LC-Electrospray-MS-MS,Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.

Preparation Methods	Method	Matrix	Method Descriptions
TOP Digest for PFAS on soil extract.	ORG70-S	SOIL	In-House Extraction followed by digestion with oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342-9349. A soil extract is taken to near dryness and made up to 5 mL with reagents. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	(●) Standard TAT (List due date):
OFFICE: Brisbane		( ) Non Standard or urgent TAT (List due date):
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	
ORDER NUMBER:		
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910	
SAMPLER: Brian Llewellyn	SAMPLER MOBILE: 0409 939 243	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to: maria.prskalo@ghd.com		
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com		

COC SEQUENCE NUMBER (Circle)

COC:	1	(2)	3	4	5	6	7
OF:	1	2	3	(4)	5	6	7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt		°C	
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
B Llewellyn	EH		
DATE/TIME: 8.8.23 1040	DATE/TIME: 09.08.23 0910	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP231X PFAS - Full suite (28 analytes)	EP231X (TOP) PFAS - TOPA (28 analytes)							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MW90_DC_0.0-31.0	27/07/2023	S	1 x HDPE jar	1	X	X							
2	MW91_DC_0.0-30.0	26/07/2023	S	1 x HDPE jar	1	X	X							
3	FD06	27/07/2023	S	1 x HDPE jar	1	X	X							
				TOTAL	3	3	3							

Environmental Division
Brisbane
Work Order Reference
EB2324147

Telephone : +61-7-3243 7222

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2324147**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: maria.prskalo@ghd.com	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 3316 3333	Facsimile	: +61-7-3243 7218
Project	: 12609270	Page	: 1 of 2
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/005)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: BRIAN LLEWELLYN		

Dates

Date Samples Received	: 04-Aug-2023 09:10	Issue Date	: 08-Aug-2023
Client Requested Due Date	: 15-Aug-2023	Scheduled Reporting Date	: **15-Aug-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 12.1°C - Ice Bricks present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - EP231X (TOP) (solids) PFAS - Total Oxidisable Precursor (TOP) Assay
EB2324147-001	27-Jul-2023 00:00	MW90_DC_0.0-31.0	✓	✓	✓
EB2324147-002	26-Jul-2023 00:00	MW91_DC_0.0-30.0	✓	✓	✓
EB2324147-003	27-Jul-2023 00:00	FD06	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

MARIA PRSKALO

- *AU Certificate of Analysis - NATA (COA)	Email	maria.prskalo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	maria.prskalo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	maria.prskalo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	maria.prskalo@ghd.com
- A4 - AU Tax Invoice (INV)	Email	maria.prskalo@ghd.com
- Chain of Custody (CoC) (COC)	Email	maria.prskalo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	maria.prskalo@ghd.com
- EDI Format - XTab (XTAB)	Email	maria.prskalo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	maria.prskalo@ghd.com

CERTIFICATE OF ANALYSIS

Work Order	: **EB2324147**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023 09:10
Order number	: ----	Date Analysis Commenced	: 08-Aug-2023
C-O-C number	: ----	Issue Date	: 14-Aug-2023 16:02
Sampler	: BRIAN LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW90_DC_0.0-31.0	MW91_DC_0.0-30.0	FD06	----	----
				Sampling date / time	27-Jul-2023 00:00	26-Jul-2023 00:00	27-Jul-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2324147-001	EB2324147-002	EB2324147-003	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**5.9**	**1.4**	**14.5**	**----**	**----**
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW90_DC_0.0-31.0	MW91_DC_0.0-30.0	FD06	----	----
				Sampling date / time	27-Jul-2023 00:00	26-Jul-2023 00:00	27-Jul-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2324147-001	EB2324147-002	EB2324147-003	--------	--------
					Result	Result	Result	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW90_DC_0.0-31.0	MW91_DC_0.0-30.0	FD06	----	----
				Sampling date / time	27-Jul-2023 00:00	26-Jul-2023 00:00	27-Jul-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2324147-001	EB2324147-002	EB2324147-003	--------	--------
					Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW90_DC_0.0-31.0	MW91_DC_0.0-30.0	FD06	----	----
				Sampling date / time	27-Jul-2023 00:00	26-Jul-2023 00:00	27-Jul-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2324147-001	EB2324147-002	EB2324147-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**98.7**	**94.5**	**80.8**	----	----
13C8-PFOA	----	0.0002	%		**103**	**97.1**	**91.4**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**84.5**	**87.0**	**87.5**	----	----
13C8-PFOA	----	0.0002	%		**99.0**	**104**	**110**	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	47	129
13C8-PFOA	----	56	128
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EB2324147**	Page	: 1 of 9
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023
Order number	: ----	Date Analysis Commenced	: 08-Aug-2023
C-O-C number	: ----	Issue Date	: 14-Aug-2023
Sampler	: BRIAN LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5221743)									
EB2323764-002	Anonymous	EA055: Moisture Content	----	0.1	%	9.9	9.7	1.6	0% - 20%
EB2324147-003	FD06	EA055: Moisture Content	----	0.1	%	14.5	14.5	0.0	0% - 20%
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5221742)									
EB2323963-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5221742)									
EB2323963-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 5221742)									
EB2323963-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 5221742) - continued									
EB2323963-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5221742)									
EB2323963-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 5221742)									
EB2323963-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5221739)									
EB2323963-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2324149-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5221739) - continued									
EB2324149-002	Anonymous	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5221739)									
EB2323963-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2324149-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5221739)									
EB2323963-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2324149-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5221739) - continued									
EB2324149-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5221739)									
EB2323963-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2324149-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 5221742)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00237 mg/kg	93.5	43.5	125
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00232 mg/kg	88.0	36.6	118
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221742)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	95.1	41.4	126
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 5221742)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221742)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221742) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00018 mg/kg	0.0	0	200
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5221739)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	90.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	97.9	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	86.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	94.1	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	105	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	86.7	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221739)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	86.9	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.5	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221739)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	61.0	139

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221739)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	95.7	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	96.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	110	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	102	54.8	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5221739)							
EB2323963-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	95.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	104	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	86.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	102	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	101	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	91.7	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221739)							
EB2323963-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	78.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	91.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	102	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	114	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	96.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	118	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	103	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221739)							
EB2323963-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	100	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	96.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	111	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221739) - continued							
EB2323963-002	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	98.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	116	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221739)							
EB2323963-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	112	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	130	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	100	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2324147**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023
Site	:	Issue Date	: 14-Aug-2023
Sampler	: BRIAN LLEWELLYN	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
MW91_DC_0.0-30.0		**26-Jul-2023**	**----**	----	**----**	**08-Aug-2023**	09-Aug-2023	✓
HDPE Soil Jar (EA055)								
MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**----**	----	**----**	**08-Aug-2023**	10-Aug-2023	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X (TOP))								
MW91_DC_0.0-30.0		**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X (TOP))								
MW91_DC_0.0-30.0		**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X (TOP))								
MW91_DC_0.0-30.0		**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X (TOP))								
MW91_DC_0.0-30.0		**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
EP231_TOP_P: PFAS Sums								
HDPE Soil Jar (EP231X (TOP))								
MW91_DC_0.0-30.0		**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X (TOP))								
MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**14-Aug-2023**	18-Sep-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) MW91_DC_0.0-30.0		**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) MW91_DC_0.0-30.0		**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) MW91_DC_0.0-30.0		**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) MW91_DC_0.0-30.0		**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) MW91_DC_0.0-30.0		**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_DC_0.0-31.0,	FD06	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	SOIL	In house, following oxidation per Houtz,Erika F.; Sedlak,David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349.: A portion of the oxidised sample is mixed with methanol (1:1) prior to analysis by LC-Electrospray-MS-MS,Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.

Preparation Methods	Method	Matrix	Method Descriptions
TOP Digest for PFAS on soil extract.	ORG70-S	SOIL	In-House Extraction followed by digestion with oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342-9349. A soil extract is taken to near dryness and made up to 5 mL with reagents. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Brisbane		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: 12609270	ALS QUOTE NO.: EN-005-21	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER:		COC: 1 2 (3) 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Maria Prskalo	CONTACT PH: 0448 844 910	OF: 1 2 3 (4) 5 6 7	Other comment:
SAMPLER: Brian Llewellyn	SAMPLER MOBILE: 0409 939 243		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):		
Email Reports to: maria.prskalo@ghd.com			
Email Invoice to: accountspayableAU@ghd.com; maria.prskalo@ghd.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
B Llewellyn	EH		
DATE/TIME: 3-8-23 1040	DATE/TIME: 04.08.23 0910	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Containers are labelled with _DC_, and should be _WB_

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EP231X PFAS - Full suite (28 analytes)	pH	EC	Total organic carbon (TOC)	Metals (Fe, Mn)				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	MW90_WB_8.0-27.0	27/07/2023	S	1 x HDPE jar + 1 x glass jar	2	X	X	X	X	X				Place PFAS container on hold, pending additional analysis if needed
2	MW91_WB_12.0-18.0	26/07/2023	S	1 x HDPE jar + 1 x glass jar	2	X	X	X	X	X				Place PFAS container on hold, pending additional analysis if needed
				TOTAL	4	2	2	2	2	2				

Environmental Division
Brisbane
Work Order Reference
EB2324149

Telephone : +61-7-3243 7222

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2324149**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: maria.prskalo@ghd.com	E-mail	: NATHAN.KING@alsglobal.com
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 3316 3333	Facsimile	: +61-7-3243 7218
Project	: 12609270	Page	: 1 of 2
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/005)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	: BRIAN LLEWELLYN		

Dates

Date Samples Received	: 04-Aug-2023 09:10	Issue Date	: 08-Aug-2023
Client Requested Due Date	: 15-Aug-2023	Scheduled Reporting Date	: **15-Aug-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 12.1°C - Ice Bricks present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EP003 Total Organic Carbon (TOC) in Soil	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)	SOIL - IN-4S pH plus EC (1:5)
EB2324149-001	27-Jul-2023 00:00	MW90_WB_8.0-27.0	✓	✓	✓	✓	✓
EB2324149-002	26-Jul-2023 00:00	MW91_WB_12.0-18.0	✓	✓	✓	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received Date	Samples Received Evaluation	Instructions Received Date	Instructions Received Evaluation
EA002: pH (1:5)							
MW90_WB_8.0-27.0	HDPE Soil Jar	03-Aug-2023	04-Aug-2023	04-Aug-2023	×	----	----
MW91_WB_12.0-18.0	HDPE Soil Jar	02-Aug-2023	03-Aug-2023	04-Aug-2023	×	----	----
EA010: Electrical Conductivity (1:5)							
MW90_WB_8.0-27.0	HDPE Soil Jar	03-Aug-2023	31-Aug-2023	04-Aug-2023	×	----	----
MW91_WB_12.0-18.0	HDPE Soil Jar	02-Aug-2023	30-Aug-2023	04-Aug-2023	×	----	----

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

MARIA PRSKALO

- *AU Certificate of Analysis - NATA (COA)	Email	maria.prskalo@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	maria.prskalo@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	maria.prskalo@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	maria.prskalo@ghd.com
- A4 - AU Tax Invoice (INV)	Email	maria.prskalo@ghd.com
- Chain of Custody (CoC) (COC)	Email	maria.prskalo@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	maria.prskalo@ghd.com
- EDI Format - XTab (XTAB)	Email	maria.prskalo@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	maria.prskalo@ghd.com

CERTIFICATE OF ANALYSIS

Work Order	: **EB2324149**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023 09:10
Order number	: ----	Date Analysis Commenced	: 08-Aug-2023
C-O-C number	: ----	Issue Date	: 15-Aug-2023 09:01
Sampler	: BRIAN LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EG005T (Total Metals by ICP-AES): EB2323764-002 shows poor duplicate results due to sample heterogeneity. This has been confirmed by visual inspection.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	MW90_WB_8.0-27.0	MW91_WB_12.0-18.0	----	----	----
			Sampling date / time	27-Jul-2023 00:00	26-Jul-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2324149-001	EB2324149-002	--------	--------	--------
				Result	Result	----	----	----
EA002: pH 1:5 (Soils)								
pH Value	----	0.1	pH Unit	**9.2**	**9.4**	----	----	----
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	**315**	**135**	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**14.2**	**8.0**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Iron	7439-89-6	50	mg/kg	**5520**	**32100**	----	----	----
Manganese	7439-96-5	5	mg/kg	**293**	**410**	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	**0.05**	**0.06**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW90_WB_8.0-27.0	MW91_WB_12.0-18.0	----	----	----
				Sampling date / time	27-Jul-2023 00:00	26-Jul-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2324149-001	EB2324149-002	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW90_WB_8.0-27.0	MW91_WB_12.0-18.0	----	----	----
				Sampling date / time	27-Jul-2023 00:00	26-Jul-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2324149-001	EB2324149-002	--------	--------	--------
					Result	Result	----	----	----
EP231P: PFAS Sums - Continued									
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	**----**	**----**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**114**	**81.0**	**----**	**----**	**----**
13C8-PFOA	----	0.0002	%		**104**	**97.0**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EB2324149**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Contact	: Nathan King
Address	: GPO BOX 668 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3316 3000	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023
Order number	: ----	Date Analysis Commenced	: 08-Aug-2023
C-O-C number	: ----	Issue Date	: 15-Aug-2023
Sampler	: BRIAN LLEWELLYN		
Site	:		
Quote number	: EN/005		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD
Timothy Creagh	Senior Chemist - Organics	Brisbane Organics, Stafford, QLD

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Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5221737)									
EB2323764-002	Anonymous	EG005T: Manganese	7439-96-5	5	mg/kg	170	# 345	68.2	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	25500	# 45800	56.7	0% - 20%
EA002: pH 1:5 (Soils) (QC Lot: 5221740)									
EB2324149-001	MW90_WB_8.0-27.0	EA002: pH Value	----	0.1	pH Unit	9.2	9.2	0.0	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 5221741)									
EB2324149-001	MW90_WB_8.0-27.0	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	315	297	5.8	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5221743)									
EB2323764-002	Anonymous	EA055: Moisture Content	----	0.1	%	9.9	9.7	1.6	0% - 20%
EB2324147-003	Anonymous	EA055: Moisture Content	----	0.1	%	14.5	14.5	0.0	0% - 20%
EP003: Total Organic Carbon (TOC) in Soil (QC Lot: 5226675)									
EB2322451-023	Anonymous	EP003: Total Organic Carbon	----	0.02	%	0.76	0.78	2.9	0% - 20%
EM2313998-008	Anonymous	EP003: Total Organic Carbon	----	0.02	%	0.57	0.57	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5221739)									
EB2323963-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2324149-002	MW91_WB_12.0-18.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5221739) - continued									
EB2324149-002	MW91_WB_12.0-18.0	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5221739)									
EB2323963-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2324149-002	MW91_WB_12.0-18.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5221739)									
EB2323963-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2324149-002	MW91_WB_12.0-18.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5221739) - continued									
EB2324149-002	MW91_WB_12.0-18.0	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5221739)									
EB2323963-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2324149-002	MW91_WB_12.0-18.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5221737)								
EG005T: Iron	7439-89-6	50	mg/kg	<50	28225.04 mg/kg	119	70.0	120
EG005T: Manganese	7439-96-5	5	mg/kg	<5	470.083 mg/kg	104	84.0	113
EA002: pH 1:5 (Soils) (QCLot: 5221740)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010: Conductivity (1:5) (QCLot: 5221741)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	101	97.0	103
EP003: Total Organic Carbon (TOC) in Soil (QCLot: 5226675)								
EP003: Total Organic Carbon	----	0.02	%	<0.02	0.55 %	105	80.0	120
				<0.02	32.3 %	98.9	80.0	120
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5221739)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	90.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	97.9	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	86.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	94.1	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	105	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	86.7	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221739)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	86.9	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.5	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221739)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221739) - continued								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	114	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221739)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	95.7	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	96.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	110	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	102	54.8	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5221739)							
EB2323963-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	95.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	104	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	86.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	102	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	101	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	91.7	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221739)							
EB2323963-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	78.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	91.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	102	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.0	72.0	129

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221739) - continued							
EB2323963-002	Anonymous	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	114	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	96.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	118	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	103	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	103	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221739)							
EB2323963-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	100	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	114	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	96.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	111	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	98.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	116	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221739)							
EB2323963-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	112	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	130	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	100	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2324149**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MS MARIA PRSKALO	Telephone	: +61-7-3243 7222
Project	: 12609270	Date Samples Received	: 04-Aug-2023
Site	:	Issue Date	: 15-Aug-2023
Sampler	: BRIAN LLEWELLYN	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	EB2323764--002	Anonymous	**Iron**	7439-89-6	56.7 %	0% - 20%	**RPD exceeds LOR based limits**
EG005(ED093)T: Total Metals by ICP-AES	EB2323764--002	Anonymous	**Manganese**	7439-96-5	68.2 %	0% - 20%	**RPD exceeds LOR based limits**

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Days overdue	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Days overdue
EA002: pH 1:5 (Soils)						
HDPE Soil Jar MW91_WB_12.0-18.0	09-Aug-2023	02-Aug-2023	**7**	----	----	----
HDPE Soil Jar MW90_WB_8.0-27.0	09-Aug-2023	03-Aug-2023	**6**	----	----	----
EA010: Conductivity (1:5)						
HDPE Soil Jar MW91_WB_12.0-18.0	09-Aug-2023	02-Aug-2023	**7**	----	----	----
HDPE Soil Jar MW90_WB_8.0-27.0	09-Aug-2023	03-Aug-2023	**6**	----	----	----

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type / Method	Count: QC	Count: Regular	Rate (%): Actual	Rate (%): Expected	Quality Control Specification
Matrix Spikes (MS)					
Total Metals by ICP-AES	0	2	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA002: pH 1:5 (Soils)							
HDPE Soil Jar (EA002) MW91_WB_12.0-18.0	**26-Jul-2023**	**09-Aug-2023**	02-Aug-2023	×	**09-Aug-2023**	09-Aug-2023	✓
HDPE Soil Jar (EA002) MW90_WB_8.0-27.0	**27-Jul-2023**	**09-Aug-2023**	03-Aug-2023	×	**09-Aug-2023**	09-Aug-2023	✓
EA010: Conductivity (1:5)							
HDPE Soil Jar (EA010) MW91_WB_12.0-18.0	**26-Jul-2023**	**09-Aug-2023**	02-Aug-2023	×	**09-Aug-2023**	06-Sep-2023	✓
HDPE Soil Jar (EA010) MW90_WB_8.0-27.0	**27-Jul-2023**	**09-Aug-2023**	03-Aug-2023	×	**09-Aug-2023**	06-Sep-2023	✓
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) MW91_WB_12.0-18.0	**26-Jul-2023**	**----**	----	----	**08-Aug-2023**	09-Aug-2023	✓
HDPE Soil Jar (EA055) MW90_WB_8.0-27.0	**27-Jul-2023**	**----**	----	----	**08-Aug-2023**	10-Aug-2023	✓
EG005(ED093)T: Total Metals by ICP-AES							
Pulp Bag (EG005T) MW91_WB_12.0-18.0	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**10-Aug-2023**	22-Jan-2024	✓
Pulp Bag (EG005T) MW90_WB_8.0-27.0	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**10-Aug-2023**	23-Jan-2024	✓
EP003: Total Organic Carbon (TOC) in Soil							
Pulp Bag (EP003) MW91_WB_12.0-18.0	**26-Jul-2023**	**10-Aug-2023**	23-Aug-2023	✓	**10-Aug-2023**	23-Aug-2023	✓
Pulp Bag (EP003) MW90_WB_8.0-27.0	**27-Jul-2023**	**10-Aug-2023**	24-Aug-2023	✓	**10-Aug-2023**	24-Aug-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) MW91_WB_12.0-18.0	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_WB_8.0-27.0	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) MW91_WB_12.0-18.0	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_WB_8.0-27.0	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) MW91_WB_12.0-18.0	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_WB_8.0-27.0	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) MW91_WB_12.0-18.0	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_WB_8.0-27.0	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) MW91_WB_12.0-18.0	**26-Jul-2023**	**09-Aug-2023**	22-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓
HDPE Soil Jar (EP231X) MW90_WB_8.0-27.0	**27-Jul-2023**	**09-Aug-2023**	23-Jan-2024	✓	**11-Aug-2023**	18-Sep-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Electrical Conductivity (1:5)	EA010	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Electrical Conductivity (1:5)	EA010	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	2	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Electrical Conductivity (1:5)	EA010	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Organic Carbon	EP003	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	0	2	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Organic Carbon	EP003	SOIL	In house C-IR17. Dried and pulverised sample is reacted with acid to remove inorganic Carbonates, then combusted in a furnace in the presence of strong oxidants / catalysts. The evolved (Organic) Carbon (as CO2) is automatically measured by infra-red detector.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Dry and Pulverise (up to 100g)	GEO30	SOIL	#
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

☐ **Sydney Laboratory**
Unit F3 Bld F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory**
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory**
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory**
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	GHD Pty Ltd	Project №	12609270	Project Manager	Maria Prskalo
Address	145 Ann Street Brisbane QLD 4000	Project Name	Callide Groundwater Bore Drilling Project	EDD Format (ESdat, EQuIS etc)	ESdat
Contact Name	Maria Prskalo				
Phone №	0448844910				
Special Directions					
Purchase Order	12609270				
Quote ID №					

| | | | | |

eurofins | Environment Testing

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Eurofins Environment Testing Australia Pty Ltd

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Rolleston,
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IANZ# 1290

Sample Receipt Advice

Company name:	GHD Pty Ltd QLD
Contact name:	Maria Prskalo
Project name:	CALLIDE GROUNDWATER BORE DRILLING PROJECT
Project ID:	12609270
Turnaround time:	5 Day
Date/Time received	Jul 27, 2023 9:00 AM
Eurofins reference	1011626

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 6.6 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Maria Prskalo - maria.prskalo@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd QLD email address.

Global Leader - Results you can trust

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web: www.eurofins.com.au
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43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: +64 3 343 5201
IANZ# 1290

Company Name: GHD Pty Ltd QLD
Address: 145 Ann Street
Brisbane
QLD 4000

Order No.: 12609270
Report #: 1011626
Phone: 07 3316 3000
Fax: 07 3316 3333

Received: Jul 27, 2023 9:00 AM
Due: Aug 3, 2023
Priority: 5 Day
Contact Name: Maria Prskalo

Project Name: CALLIDE GROUNDWATER BORE DRILLING PROJECT
Project ID: 12609270

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Conductivity (1:5 aqueous extract at 25 °C as rec.)	Iron	Manganese	pH (1:5 Aqueous extract at 25 °C as rec.)	Total Organic Carbon	Total Oxidisable Precursor	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254										X			
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X	X		X	X	X
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	FS01_SS	Jul 12, 2023		Soil	B23-Jl0062426							X	X
2	FS02_SS	Jul 21, 2023		Soil	B23-Jl0062427							X	X
3	FS03_SS	Jul 22, 2023		Soil	B23-Jl0062428							X	X
4	FS04_DC	Jul 23, 2023		Soil	B23-Jl0062429							X	X
5	FS05_WB	Jul 24, 2023		Soil	B23-Jl0062430	X	X	X	X	X		X	X
6	FS06_DC	Jul 13, 2023		Soil	B23-Jl0062431							X	X
7	FS01_SS	Jul 12, 2023		TOP - Soil	B23-Jl0062432						X	X	X
8	FS02_SS	Jul 21, 2023		TOP - Soil	B23-Jl0062433						X	X	X
9	FS04_DC	Jul 21, 2023		TOP - Soil	B23-Jl0062434						X	X	X
10	FS06_DC	Jul 13, 2023		TOP - Soil	B23-Jl0062435						X	X	X
Test Counts						1	1	1	1	1	4	10	10

GHD Pty Ltd QLD
145 Ann Street
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Maria Prskalo**

Report **1011626-S**
Project name CALLIDE GROUNDWATER BORE DRILLING PROJECT
Project ID 12609270
Received Date Jul 27, 2023

Client Sample ID			**FS01_SS**	**FS02_SS**	**FS03_SS**	**FS04_DC**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B23-JI0062426**	**B23-JI0062427**	**B23-JI0062428**	**B23-JI0062429**
Date Sampled			**Jul 12, 2023**	**Jul 21, 2023**	**Jul 22, 2023**	**Jul 23, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	14	17	16	8.0
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	106	119	95	103
13C5-PFPeA (surr.)	1	%	114	126	109	109
13C5-PFHxA (surr.)	1	%	110	97	93	89
13C4-PFHpA (surr.)	1	%	94	96	85	83
13C8-PFOA (surr.)	1	%	101	106	99	100
13C5-PFNA (surr.)	1	%	104	105	107	109
13C6-PFDA (surr.)	1	%	115	113	117	113
13C2-PFUnDA (surr.)	1	%	124	133	122	123
13C2-PFDoDA (surr.)	1	%	102	122	97	102
13C2-PFTeDA (surr.)	1	%	134	93	129	136
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	109	147	108	114

Client Sample ID			FS01_SS	FS02_SS	FS03_SS	FS04_DC
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B23-JI0062426	B23-JI0062427	B23-JI0062428	B23-JI0062429
Date Sampled			Jul 12, 2023	Jul 21, 2023	Jul 22, 2023	Jul 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D3-N-MeFOSA (surr.)	1	%	115	84	110	113
D5-N-EtFOSA (surr.)	1	%	112	114	115	111
D7-N-MeFOSE (surr.)	1	%	110	65	102	109
D9-N-EtFOSE (surr.)	1	%	132	117	130	125
D5-N-EtFOSAA (surr.)	1	%	103	164	98	104
D3-N-MeFOSAA (surr.)	1	%	115	189	119	121
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	81	92	81	80
18O2-PFHxS (surr.)	1	%	126	104	123	125
13C8-PFOS (surr.)	1	%	138	112	142	144
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	83	56	55	59
13C2-6:2 FTSA (surr.)	1	%	71	68	68	69
13C2-8:2 FTSA (surr.)	1	%	90	105	92	108
13C2-10:2 FTSA (surr.)	1	%	109	INT	100	108
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			FS05_WB	FS06_DC	FS01_SS	FS02_SS
Sample Matrix			Soil	Soil	TOP - Soil	TOP - Soil
Eurofins Sample No.			B23-JI0062430	B23-JI0062431	B23-JI0062432	B23-JI0062433
Date Sampled			Jul 24, 2023	Jul 13, 2023	Jul 12, 2023	Jul 21, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	4.2	8.3	13	18

Client Sample ID			FS05_WB	FS06_DC	FS01_SS	FS02_SS
Sample Matrix			Soil	Soil	TOP - Soil	TOP - Soil
Eurofins Sample No.			B23-JI0062430	B23-JI0062431	B23-JI0062432	B23-JI0062433
Date Sampled			Jul 24, 2023	Jul 13, 2023	Jul 12, 2023	Jul 21, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	5.3	6.0
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	5.3	< 5
13C4-PFBA (surr.)	1	%	115	112	63	52
13C5-PFPeA (surr.)	1	%	116	116	87	68
13C5-PFHxA (surr.)	1	%	89	95	91	59
13C4-PFHpA (surr.)	1	%	83	78	74	61
13C8-PFOA (surr.)	1	%	94	90	88	79
13C5-PFNA (surr.)	1	%	96	97	97	83
13C6-PFDA (surr.)	1	%	107	106	108	100
13C2-PFUnDA (surr.)	1	%	111	113	104	94
13C2-PFDoDA (surr.)	1	%	95	94	105	95
13C2-PFTeDA (surr.)	1	%	132	126	121	114
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	108	110	105	97
D3-N-MeFOSA (surr.)	1	%	113	114	110	108
D5-N-EtFOSA (surr.)	1	%	108	110	98	96
D7-N-MeFOSE (surr.)	1	%	111	105	116	103
D9-N-EtFOSE (surr.)	1	%	130	124	99	95
D5-N-EtFOSAA (surr.)	1	%	103	101	104	94
D3-N-MeFOSAA (surr.)	1	%	135	129	115	107
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	81	80	106	81

Client Sample ID			FS05_WB	FS06_DC	FS01_SS	FS02_SS
Sample Matrix			Soil	Soil	TOP - Soil	TOP - Soil
Eurofins Sample No.			B23-JI0062430	B23-JI0062431	B23-JI0062432	B23-JI0062433
Date Sampled			Jul 24, 2023	Jul 13, 2023	Jul 12, 2023	Jul 21, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
18O2-PFHxS (surr.)	1	%	115	121	100	97
13C8-PFOS (surr.)	1	%	135	132	102	92
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	60	58	45	37
13C2-6:2 FTSA (surr.)	1	%	80	76	64	69
13C2-8:2 FTSA (surr.)	1	%	79	80	91	79
13C2-10:2 FTSA (surr.)	1	%	101	107	119	110
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	200	-	-	-
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	9.4	-	-	-
Total Organic Carbon	0.1	%	< 0.1	-	-	-
Heavy Metals						
Iron	20	mg/kg	44000	-	-	-
Manganese	5	mg/kg	990	-	-	-

Client Sample ID			FS04_DC	FS06_DC
Sample Matrix			TOP - Soil	TOP - Soil
Eurofins Sample No.			B23-JI0062434	B23-JI0062435
Date Sampled			Jul 21, 2023	Jul 13, 2023
Test/Reference	LOR	Unit		
Sample Properties				
% Moisture	1	%	7.7	8.8
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	65	73

Client Sample ID			FS04_DC	FS06_DC
Sample Matrix			TOP - Soil	TOP - Soil
Eurofins Sample No.			B23-JI0062434	B23-JI0062435
Date Sampled			Jul 21, 2023	Jul 13, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
13C5-PFPeA (surr.)	1	%	99	103
13C5-PFHxA (surr.)	1	%	93	88
13C4-PFHpA (surr.)	1	%	77	76
13C8-PFOA (surr.)	1	%	94	96
13C5-PFNA (surr.)	1	%	99	104
13C6-PFDA (surr.)	1	%	115	118
13C2-PFUnDA (surr.)	1	%	108	114
13C2-PFDoDA (surr.)	1	%	106	114
13C2-PFTeDA (surr.)	1	%	121	135
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10
13C8-FOSA (surr.)	1	%	115	115
D3-N-MeFOSA (surr.)	1	%	136	130
D5-N-EtFOSA (surr.)	1	%	117	112
D7-N-MeFOSE (surr.)	1	%	123	125
D9-N-EtFOSE (surr.)	1	%	112	112
D5-N-EtFOSAA (surr.)	1	%	110	113
D3-N-MeFOSAA (surr.)	1	%	122	128
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5
13C3-PFBS (surr.)	1	%	113	108
18O2-PFHxS (surr.)	1	%	115	113
13C8-PFOS (surr.)	1	%	106	106
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	45	48
13C2-6:2 FTSA (surr.)	1	%	75	80

Client Sample ID			FS04_DC	FS06_DC
Sample Matrix			TOP - Soil	TOP - Soil
Eurofins Sample No.			B23-JI0062434	B23-JI0062435
Date Sampled			Jul 21, 2023	Jul 13, 2023
Test/Reference	LOR	Unit		
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
13C2-8:2 FTSA (surr.)	1	%	97	103
13C2-10:2 FTSA (surr.)	1	%	118	126
PFASs Summations				
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Brisbane	Jul 27, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Jul 28, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Jul 28, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Jul 28, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Jul 28, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Brisbane	Jul 31, 2023	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25 °C as rec.)	Brisbane	Jul 31, 2023	7 Days
- Method: APHA 4500-H+ B. Electrometric Method			
Total Organic Carbon	Melbourne	Aug 01, 2023	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Heavy Metals	Brisbane	Jul 28, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins

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Report #: 1011626
Phone: 07 3316 3000
Fax: 07 3316 3333

Received: Jul 27, 2023 9:00 AM
Due: Aug 3, 2023
Priority: 5 Day
Contact Name: Maria Prskalo

Project Name: CALLIDE GROUNDWATER BORE DRILLING PROJECT
Project ID: 12609270

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Conductivity (1:5 aqueous extract at 25 °C as rec.)	Iron	Manganese	pH (1:5 Aqueous extract at 25 °C as rec.)	Total Organic Carbon	Total Oxidisable Precursor	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254										X			
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X	X		X	X	X
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	FS01_SS	Jul 12, 2023		Soil	B23-Jl0062426							X	X
2	FS02_SS	Jul 21, 2023		Soil	B23-Jl0062427							X	X
3	FS03_SS	Jul 22, 2023		Soil	B23-Jl0062428							X	X
4	FS04_DC	Jul 23, 2023		Soil	B23-Jl0062429							X	X
5	FS05_WB	Jul 24, 2023		Soil	B23-Jl0062430	X	X	X	X	X		X	X
6	FS06_DC	Jul 13, 2023		Soil	B23-Jl0062431							X	X
7	FS01_SS	Jul 12, 2023		TOP - Soil	B23-Jl0062432						X	X	X
8	FS02_SS	Jul 21, 2023		TOP - Soil	B23-Jl0062433						X	X	X
9	FS04_DC	Jul 21, 2023		TOP - Soil	B23-Jl0062434						X	X	X
10	FS06_DC	Jul 13, 2023		TOP - Soil	B23-Jl0062435						X	X	X
Test Counts						1	1	1	1	1	4	10	10

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
Method Blank							
Total Organic Carbon	%	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Iron	mg/kg	< 20			20	Pass	
Manganese	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	102			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	104			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	116			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	112			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	111			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorononanoic acid (PFNA)	%	122			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	94			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	106			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	134			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	143			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	123			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	110			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	106			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	112			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	121			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	103			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	137			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	125			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	101			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	132			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	77			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	99			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	107			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	130			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	111			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	82			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	121			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	109			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	126			50-150	Pass	
LCS - % Recovery							
Total Organic Carbon	%	103			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Iron	%	97			80-120	Pass	
Manganese	%	98			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B23-JI0062467	NCP	%	98			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B23-JI0062467	NCP	%	101			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B23-JI0062467	NCP	%	113			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-JI0062467	NCP	%	113			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B23-JI0062467	NCP	%	101			50-150	Pass	
Perfluorononanoic acid (PFNA)	B23-JI0062467	NCP	%	133			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B23-JI0062467	NCP	%	90			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-JI0062467	NCP	%	105			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-JI0062467	NCP	%	133			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-JI0062467	NCP	%	126			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-JI0062467	NCP	%	134			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B23-Jl0062467	NCP	%	103			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Jl0062467	NCP	%	98			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Jl0062467	NCP	%	97			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Jl0062467	NCP	%	110			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Jl0062467	NCP	%	93			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Jl0062467	NCP	%	127			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Jl0062467	NCP	%	119			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B23-Jl0062467	NCP	%	98			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Jl0062467	NCP	%	139			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Jl0062467	NCP	%	82			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Jl0062467	NCP	%	90			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Jl0062467	NCP	%	143			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Jl0062467	NCP	%	128			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Jl0062467	NCP	%	75			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Jl0062467	NCP	%	96			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Jl0062467	NCP	%	124			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Jl0062467	NCP	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Jl0062467	NCP	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Jl0062467	NCP	%	137			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Jl0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Jl0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Jl0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Jl0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B23-Jl0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Jl0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Jl0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Jl0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-JI0062426	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-JI0062426	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-JI0062426	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-JI0062426	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
pH (1:5 Aqueous extract at 25 °C as rec.)	B23-JI0062430	CP	pH Units	9.4	9.3	<1	30%	Pass	
Total Organic Carbon	B23-JI0061740	NCP	%	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Iron	B23-Jl0062430	CP	mg/kg	44000	44000	<1	30%	Pass	
Manganese	B23-Jl0062430	CP	mg/kg	990	970	1.5	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Jl0062432	CP	ug/kg	5.3	5.6	5.7	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Jl0062432	CP	ug/kg	5.3	< 5	15	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Jl0062432	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Jl0062432	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Jl0062432	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Jl0062432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	B23-Jl0062434	CP	%	7.7	8.2	6.6	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Paige Howarth	Analytical Services Manager
Sarah McCallion	Senior Analyst-PFAS
Caitlin Breeze	Senior Analyst-Inorganic
Jonathon Angell	Senior Analyst-Inorganic
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties
Jonathon Angell	Senior Analyst-Metal



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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APPENDIX P ENVIROPACIFIC REMEDIATION DOCUMENTATION

COMPLETION REPORT

CS Energy
Callide Power Station
PFAS Project

Service Order No. 4700078702

Client: CS Energy Limited

Site Address:

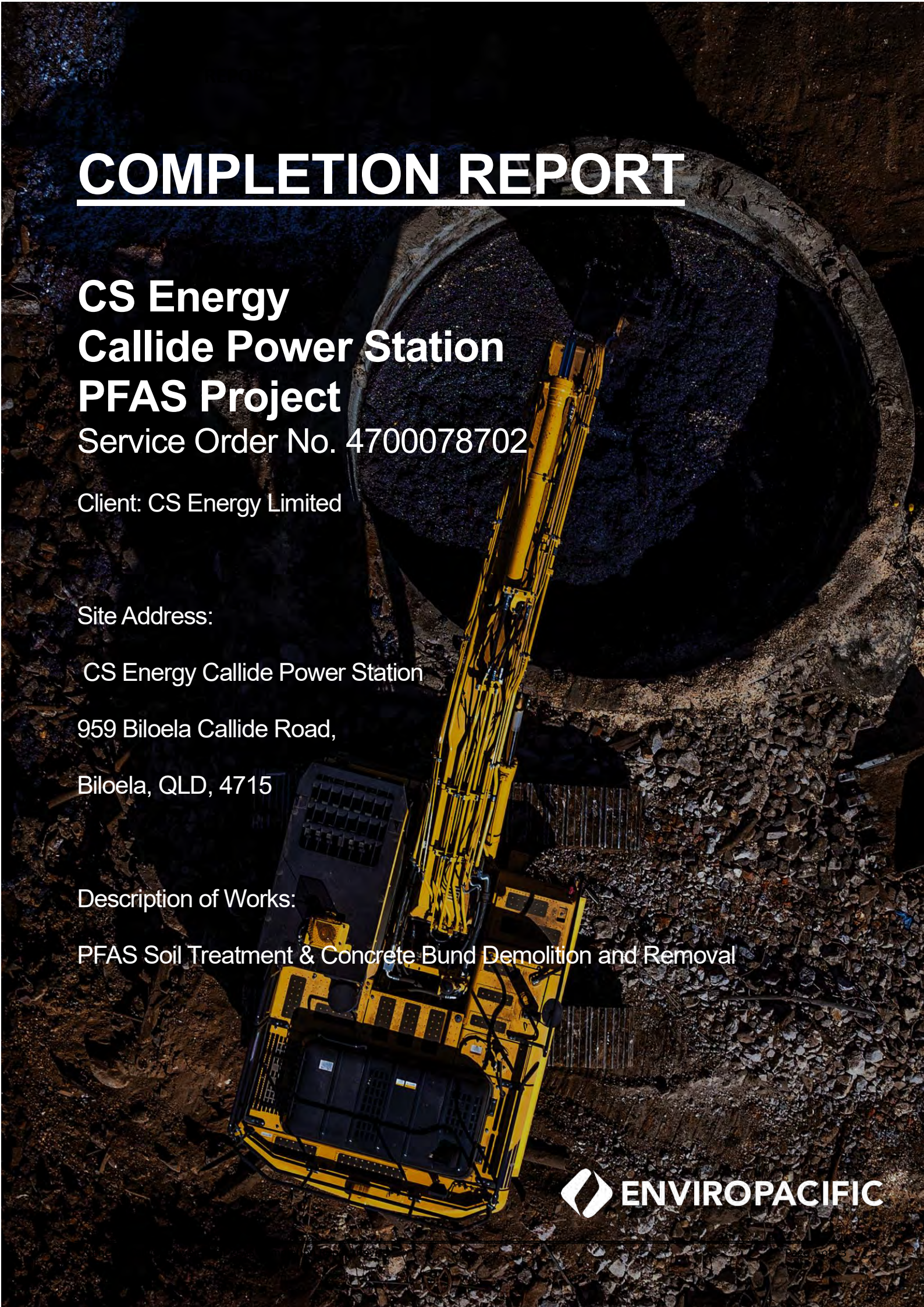
CS Energy Callide Power Station

959 Biloela Callide Road,

Biloela, QLD, 4715

Description of Works:

PFAS Soil Treatment & Concrete Bund Demolition and Removal



ENVIROPACIFIC

PROJECT VERSION REVISION STATUS

VERSION AND DATE	COMMENTS	PREPARED / REVISED BY	SIGNATURE	REVIEW AND APPROVAL OF CONTENT BY	SIGNATURE
18/09/2023	Submitted to Client	Quentin Xu	QX	Jack Findlay	
6/11/2023	Revision 1 based on comments sent through by the Client	Quentin Xu		Adrian Scott	

DISTRIBUTION

NAME	COPIES	ISSUE DATE
ENVIROPACIFIC SERVICES LIMITED	1	18/09/2023
CS ENERGY LIMITED	1	18/09/2023

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TABLE OF CONTENTS

1. INTRODUCTION 4
SCOPE OF WORKS 4
2. PROJECT QHSE MANAGEMENT 5
Work Procedures 5
Safe Work Methods Statement (SWMS) 5
Consultations, Checklists, and Inspections 6
3. WASTE CLASSIFICATION & SOIL TREATMENT 6
4. BACKFILL AND COMPACTION 7
5. NOTE ON PHOTOGRAPHIC RECORDS 8
6. Appendix A – Enviropacific QHSE Documentation 9
7. Appendix B – Material Export 10
8. Appendix C – Laboratory Certificates of Analysis 11
9. Appendix D – Survey 12
10. Appendix E – Level 1 Geotechnical Report 13

ACRONYMS

FTG	Fire Training Ground
ITT	Invitation to Tender
LOR	Limit of Reporting
MDD	Maximum Dry Density
NDD	Non-Destructive Digging
OMC	Optimum Moisture Content
PAC	Powdered Activated Carbon
PFAS	Perfluoroalkyl and Polyfluoroalkyl Substances
PTW	Permit to Work
WTC	Waste Transport Certificate
W/W	Weight to Weight

1. INTRODUCTION

This Completion Report forms part of the management system under which Enviropacific Services Limited (Enviropacific) undertakes PFAS Soil Remediation works for CS Energy Limited (CS Energy) Callide Power Station.

The purpose of this Completion Report is to specify a summary of Enviropacific's completion of the Service Order No. 4700078702 project with all supporting documentation. This report will be used as a mutual agreement with CS Energy and Enviropacific to verify that Enviropacific has completed all contract objectives.

SCOPE OF WORKS

FTG

Remediation in the fire training ground was broken into three sections, as outlined and described below:

- Remediation Area 2 - Unsealed area surrounding the concrete fire training bund: Excavation of soils to the depth and extent nominated in the ITT Section C - Scope of Work (in-situ volume nominally 852m³ total for FTG Area), onsite treatment to stabilise leachable PFAS and reduce soil permeability, and reinstatement with compaction under Level 1 geotechnical supervision.
- Remediation Area 3 - Unsealed drainage line located north of the FTG concrete bunded area: Excavation of soils to the depth and extent nominated in the ITT Section C - Scope of Work, onsite treatment to stabilise leachable PFAS and reduce soil permeability, and reinstatement with compaction under Level 1 geotechnical supervision.
- Remediation Area 1 - Concrete fire training bund: Thorough cleaning of the floor and bund walls using a high-pressure jet. The block walls will be covered with Xypex Megamix I. The concrete slab was sprayed with Xypex X55 and removed using a high-pressure wash after 28 days to decontaminate the surface in accordance with the manufacturer's specifications. Noting that the aprons outside of the bund were not treated, as no firefighting was performed in these areas. This process was unsuccessful, with a reduction in leachability of the concrete slab not observed, as such additional further works were completed as follows.
    - The concrete fire training bund was demolished, and the subsequent waste was classified for transport offsite to the nominated licensed waste disposal facility.
    - The unsealed area underneath the concrete FTG bund was excavated to stockpile to a depth of approximately 1 metre. With further additional localised excavation was completed for an additional 0.5m after failed validation.
    - Excavated stockpiled soils were treated with Powdered Activated Carbon (PAC) at 0.5% (weight/weight) to stabilise leachable PFAS in the soil matrix. Post-treatment analysis was undertaken to confirm a reduction in leachability of greater than 95%.
    - All oversized rocks located within the remediation footprint were crushed using a concrete pulverising attachment and treated with PAC to enable re-use as part of the backfilling process,
    - Reinstatement of treated soils placed back into the original area with compaction of 300mm layers under Level 1 Geotechnical Supervision. Each layer was compacted to a minimum of 95% Maximum Dry Density (MDD). 2% w/w compacted Bentonite was added to the treated material to reduce the soil matrix permeability.

FOT

Remediation in the Fuel Oil Tank location was broken into four sections, as outlined and described below:

- Remediation Area 1 – The unsealed area immediately south of the FOT, bound by the FOT to the north and sealed access roads to the south, east, and west: excavation of soils to the depth and extent nominated in the ITT Section C - Scope of Work (revised in-situ volume nominally 764m³), onsite treatment to stabilise leachable PFAS and reduce soil permeability, and reinstatement with compaction under Level 1 geotechnical supervision.
- Remediation Area 2 – The unsealed area east of the FOT, bound by the FOT to the west, FOT Remediation Area 1 to the south, sealed access road to the east and limited to the extent of the FOT to the north: Excavation of soils to the depth and extent nominated in the ITT Section C - Scope of Work (revised in-situ volume nominally 401m³), onsite treatment to stabilise leachable PFAS and reduce soil permeability, and reinstatement with compaction under Level 1 geotechnical supervision.
- Remediation Area 3 – The unsealed area west of the FOT, bound by fire water tanks to the west and sealed access roads to the north, south, and east. Excavation of soils to the depth and extent nominated in the ITT Section C - Scope of Work (revised in-situ volume nominally 1058m³), onsite treatment to stabilise leachable PFAS and reduce soil permeability, and reinstatement with compaction under Level 1 geotechnical supervision.
- Remediation Area 4 – The Unsealed area north-west of the FOT, bound by fire water pipes to the north and west and sealed access roads to the south and east: Excavation of soils to the depth and extent nominated in the ITT Section C - Scope of Work (revised in-situ volume nominally 79m³), onsite treatment to stabilise leachable PFAS and reduce soil permeability, and reinstatement with compaction under Level 1 geotechnical supervision.

2. PROJECT QHSE MANAGEMENT

Work Procedures

All site works were undertaken in accordance with EPS Project Specific Quality, Health, Safety and Environmental (QHSE) documentation.

These QHSE Project Plans include:

- Project Execution Plan (PEP)
- Site Specific Work Methodology
- Construction Environmental Management Plan
- Workplace Health, Safety, Environment, Quality and Site Management Plan (WHSEQSMP)
- Site Specific Remediation Plan

Safe Work Methods Statement (SWMS)

SWMS – Working around Plant and Excavation

SWMS – High-Risk Construction Work: Working around Mobile Plant, Excavation, Services and Lifting Operations

SWMS – High-Risk Construction Work: Working around Plant, falls – Pugmill Specific

Consultations, Checklists, and Inspections

- Daily Work Briefings (Pre-Starts)
- Toolbox Talks
- Weekly QHSE Site Inspections
- Excavation Inspections
- Inspection and Test Plans/Reports/Checklists
- Safe Operating Procedures (SOP)
- Onsite and Offsite Material Movement Register (ITR)

A selection of these plans and works procedures are provided in Appendix A – Enviropacific QHSE Documentation.

3. WASTE CLASSIFICATION & SOIL TREATMENT

FTG & FOT Soil Stabilisation

Untreated stockpiles were sampled at the rate of 1:250m³ of in-situ soil volume + 1:10 ratio for duplicate QA/QC samples. The samples were analysed for leachable PFHxS & PFOS to establish the pre-treatment levels.

The soils were treated through the pugmill with the addition of 0.5% w/w PAC in accordance with the previously conducted site-specific treatment trial. The PAC addition was pre-treated via bucket mixing and then fed through a high-shear pugmill using the front-end loader. Oversized rock (>100mm) was screened out using the Colt 1000 Mobile Screen, crushed using a pulverising attachment and added back into the treated soil matrix before backfilling. The treated soil and PAC volumes added during the remedial works were recorded in ITPs and ITRs relating to the project.

Daily treated soil volumes were stockpiled as individually identified and recorded Lots, then sampled for NATA laboratory analysis as proof of treatment performance at the rate of 1:100m³ of in-situ soil volume + 1:10 ratio for duplicate QA/QC samples, analysed for leachable PFHxS & PFOS. All stockpile volume, location, lot number, and sampling information were recorded on project ITRs which are referenced back to the excavation location and extent for that day's soil treatment works. Laboratory results confirming a minimum of 95% reduction in the sum of leachable PFHxS & PFOS were considered a successful treatment. Laboratory Certificates of Analysis are provided in Appendix C – Laboratory Certificates of Analysis. Upon successful treatment and reduction in leachable PFHxS & PFOS the treated stockpiles were mixed with 2% w/w bentonite using an excavator prior to backfill.

FTG Concrete Bund Demolition and Remediation

The FTG concrete bund was demolished and disposed of offsite under waste code M270 to a nominated licensed waste disposal company, BMI Staplyton. All concrete waste disposed offsite was tracked via Waste Transport Certificates (WTC). Details of offsite disposal are included in Appendix B – Material Export.

Surveying was implemented to conduct measurements of the volume of soil excavated as part for the remedial works. A surveyor did the initial pick-up volume of the surface and then conducted the excavation ground pick-ups to calculate the volume of excavation. The Survey volumes are provided in Appendix D – Survey.

The soils were treated via a bucket mixing methodology with the addition of 0.5% w/w PAC. Daily treated soil volumes will be stockpiled as individually identified and recorded, then sampled for NATA laboratory analysis as proof of treatment performance at the rate of 1:100m³ of in-situ soil volume + 1:10 ratio for duplicate QA/QC

samples, with analysis for leachable PFHxS & PFOS. All stockpile volume, location, and sampling information will be recorded on project ITRs which will be referenced back to the excavation location and extent for the day's soil treatment works. Laboratory results confirming a minimum of 95% reduction in the sum of leachable PFHxS & PFOS are considered successfully treated. Laboratory Certificates of Analysis are provided in Appendix C – Laboratory Certificates of Analysis. Upon successful treatment and reduction in leachable PFHxS & PFOS, the treated stockpiles were mixed with 2% w/w bentonite using an excavator.

It should be noted that the remedial works across both locations were undertaken to the extent practicable, with clearly defined exclusion zones created around the existing underground services, as daylighted using non-destructive drilling, to ensure they weren't impacted during the remedial works.

4. BACKFILL AND COMPACTION

Backfilled excavations were profiled as near as practicable from the pre-existing landform features and batters of each area. The areas were reinstated to include functioning surface drainage. Compaction testing was conducted to confirm the compaction criteria of 95% MDD had been met, and a hold point release was prepared and approved by the CS Energy representative. The Level 1 Geotechnical report for the remedial works has been provided in Appendix E – Level 1 Geotechnical Report.

5. NOTE ON PHOTOGRAPHIC RECORDS



Figure 1. FTG Concrete Bund Removal and final level after PAC treatment and backfill



Figure 2. FOT Areas 1, 2, 3 and 4 (Birds Eye View)

6. APPENDIX A – ENVIROPACIFIC QHSE DOCUMENTATION

INSPECTION AND TEST PLAN ITP01

ENVIROPACIFIC

Project title: CS Energy Callide PFAS	**Project No:** 107223
ITP prepared by: Jack Vahtera	**Date:** 07/09/2022
Location for inspection/testing: CS Energy Callide Power Station, 959 Biloela Callide Road, Mount Murchison QLD 4715	**Revision:** 0
Description of activity: Site setup, remediation earthworks, temporary stockpiling, soil treatment, reinstatement & compaction	

ID #	Process Step	Stage / Frequency	State Quality Acceptance Criteria	Records of Inspection or Test (s)	Inspection/Test Responsibility		Date Inspected*	Comments or NCR	Signed (EPS)	Signed (Client)
					Enviro-pacific	Client				
(1) 1.	Project plans	Before mobilising	Project plans reviewed & approved by client	Approvals from client ITP sign off	H	R, H	14/9/22			
2.	Site inductions	At commencing	Client & EPS induction completed	Induction certificates / register ITP sign off	D	W	15/9/22			
(2) 3.	Pre works survey	Before works	Work areas surveyed to verify original levels	Survey result ITP sign off	H	H	14/09/22			
(3) 4.	Dilapidation photos	Before works	Document initial condition of the work areas and transport routes by taking photos	Photos ITP sign off	H, D	W	15/09/22			
5.	Traffic management	Before dump truck movements, ongoing monitoring	Signs installed to client satisfaction EP-HSE-19-MPR Traffic Management Procedure EP-HSE-19-FRM-01 Traffic Management Plan	ITP sign off	D, V	W	22/09/22			
6.	Permit To Work	Before breaking ground	Permit to work completed & signed before breaking ground or driving star pickets	Permit to work documentation ITP sign off	D	D	19/09/22			

Records of Inspection or Test Legend: List Inspection and Test Report Type. * For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

Inspection/Test Responsibility Legend: X = Worker or workgroup self-inspection; H = Hold Point; D = Document; R = Review; V = Visual; W = Witness; C = Consultant responsibility to EPS

ID #	Process Step	Stage / Frequency	State Quality Acceptance Criteria	Records of Inspection or Test (s)	Inspection/Test Responsibility		Date Inspected*	Comments or NCR	Signed (EPS)	Signed (Client)
					Enviro-pacific	Client				
(4) 7.	Stockpile & treatment area preparation	Before service location	Base sampled at rate of 1:400m2 + 1:10 ratio for duplicate QA/QC samples Low bunds built from site won soils 50mm bottom scraped, mixed with 1 Tn PAC, and track rolled EP-HSE-07-MPR - Plant and Equipment Procedure	Laboratory certificates ITP sign off	W, H	H	20/09/22			
8.	Service location	Before excavation works	Services within work areas located and daylighted with NDD NDD waste emptied onto stockpile & treatment area to dry out and be treated with other soils	Permit to work documentation ITP sign off	D	W	29/9/22			
9.	Excavation and stockpiling works	Ongoing	Material movements tracked, loads counted, and stockpiles identified Stockpiles sealed with Stonewall as required EP-HSE-15-MPR Excavation Procedure	ITR01 ITR04 ITP sign off	D	W	24/10/22			
10	Validation of excavations	Completion of excavation	Epic Environmental to take validation samples from excavations	Laboratory certificates ITP sign off	W	H, D	24/10/22			
(5) 11	Excavation survey	After validation	Excavations surveyed to verify volumes	Survey result ITP sign off	H	H	25/10/22			

Records of Inspection or Test Legend: List Inspection and Test Report Type. * For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

Inspection/Test Responsibility Legend: X = Worker or workgroup self-inspection; H = Hold Point; D = Document; R = Review; V = Visual; W = Witness; C = Consultant responsibility to EPS

ID #	Process Step	Stage / Frequency	State Quality Acceptance Criteria	Records of Inspection or Test (s)	Inspection/Test Responsibility		Date Inspected*	Comments or NCR	Signed (EPS)	Signed (Client)
					Enviro-pacific	Client				
12	Soil treatment works	Ongoing	Untreated soil stockpiles sampled at rate of 1:250m3 of insitu soil volume + 1:10 ratio for duplicate QA/QC samples Soils treated with 0.5% PAC Treated soil stockpiles sampled at rate of 1:100m3 of insitu soil volume + 1:10 ratio for duplicate QA/QC samples Laboratory results proving at least 95% reduction in the sum of leachable PFHxS & PFOS Soils mixed with 2% bentonite after confirmed to meet criteria	Laboratory certificates ITR02 ITP sign off	H	H	15/11/22			
13	Application of PAC to base of excavations	Before backfilling	Application of PAC to base surfaces of all excavation areas at rate of 20kg of PAC per 100m2	ITP sign off	H	H	25/11/22			
14	Backfilling & make good	After treatment	Excavations backfilled to surrounding levels Soils placed in 300mm layers and compacted to 95% under Level 1 supervision Treatment area levelled to original levels Any excess material married into the general treatment area	Compaction certificates ITP sign off	H	H	29/11/22			

Records of Inspection or Test Legend: List Inspection and Test Report Type. * For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

Inspection/Test Responsibility Legend: X = Worker or workgroup self-inspection; H = Hold Point; D = Document; R = Review; V = Visual; W = Witness; C = Consultant responsibility to EPS

ID #	Process Step	Stage / Frequency	State Quality Acceptance Criteria	Records of Inspection or Test (s)	Inspection/Test Responsibility		Date Inspected*	Comments or NCR	Signed (EPS)	Signed (Client)
					Enviro-pacific	Client				
15	Site survey	Completion of backfilling	Work areas surveyed to verify final levels	Survey result ITP sign off	H	H	2/12/22			
16	Hydro mulching	After survey	Couch & Rhodes grasses at 10kg/Ha each	ITP sign off	D	W	2/12/22			
17	FTG concrete pad cleaning and encapsulation	Timing of works TBC	Prepare surfaces including floor & exposed faces of kerbs & bunds of the FTG by high-pressure water blasting, then apply Xypex in a spray-applied slurry & allow to cure. Offsite disposal of PFAS-impacted cleaning waters	Subcontractor documentation ITP sign off	D	W	3/12/22			
18	Demobilisation	At completion	All plant and equipment removed and site left tidy	ITP sign off	V	W	2/12/22			
19	Dilapidation photos	After works	Document final condition of the retail building by taking photos	Photos ITP sign off	H, D	W	2/12/22			

Records of Inspection or Test Legend: List Inspection and Test Report Type. * For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

Inspection/Test Responsibility Legend: X = Worker or workgroup self-inspection; H = Hold Point; D = Document; R = Review; V = Visual; W = Witness; C = Consultant responsibility to EPS

AMENDMENTS			
No.	Description of amendment made	Date	Approved by PM (sign)

PERSONNEL COMPLETING THIS ITP			
No	EPS Rep Name	Position	Signature

Records of Inspection or Test Legend: List Inspection and Test Report Type. * For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

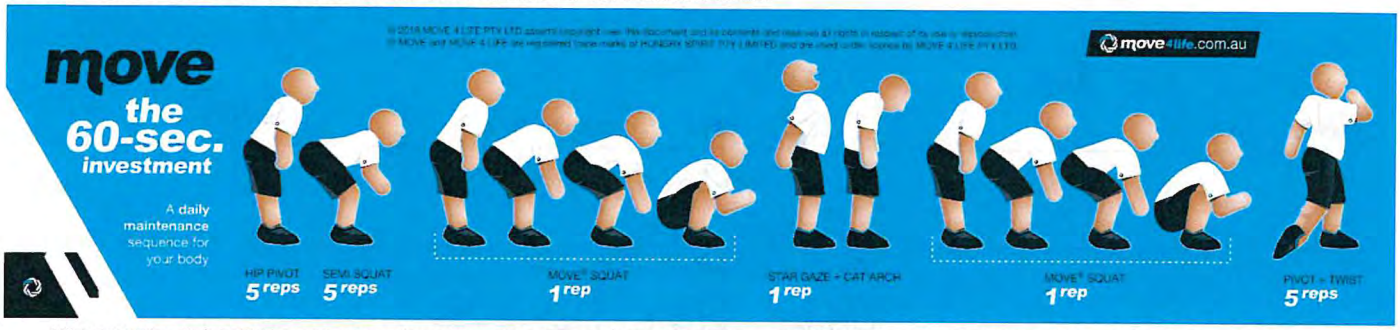
Inspection/Test Responsibility Legend: X = Worker or workgroup self-inspection; H = Hold Point; D = Document; R = Review; V = Visual; W = Witness; C = Consultant responsibility to EPS

Project Name: CS Energy **Project No:** 1072283 **Date:** 7-3-23

Name of supervisor/presenter: Dave Spencer.

Today's Forecast – Max. Temp: 35° **UV Index:** 12 **Wind Speed:** N/E 15/20 **Rainfall:** 5% 0mm.

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards)
Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	Exclusion zone around concrete slab	2. EXCAVATION	—
3. ELECTRICAL & SERVICES	Rod on Generator	4. WORK AT HEIGHT	—
5. ASBESTOS & DEMOLITION	—	6. CONFINED SPACE & HAZ ATMOSPHERE	—
7. TEMPORARY WORKS	—	8. FITNESS FOR WORK	Well rested and free from the effects of drugs and alcohol
9. ENVIRO SITE MANAGEMENT	Place all rubbish in onsite bins.	10. SOIL & WATER	PFAS contaminated water. Wash hands before eating and drinking.
11. AIR & AMENITY	Control any dust with water suppression	**The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.**	

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Items Raised from Yesterday / Previous Meeting

Today's Activities		
Activity	**Key Hazards / Controls**	**SWMS For this Task**
1. SET UP AND RUN BASIC WTP.	ELECTRIC SHOCK — RCD'S ON GENERATOR.	SWP
2.	FUEL WORK AND DUST — CORRECT PPE	
3.	MANUAL HANDLING — CORRECT LIFTING TECHNIQUES.	
4.	DUST — DUST MASKS.	
5.	HEAT & HUMIDITY. DRINK PLENTY OF FLUIDS.	
6.		
7.		
8.		

List Permits or additional Training required to carry out today's activities	

Suggestions or comments raised by attendees

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Attendance record:

- I understand the general site works (activities) presented in this Daily Consultation Briefing and have signed onto the SWMS applicable to my specific task(s).
- I have raised any safety issues with the supervisor/presenter before commencing work.
- I am fit for work to perform my tasks/duties today.

COMPLETE TAKE-5 PRIOR TO COMMENCING WORK

Print Name	Signature	Company	Time On Site	Time Off Site
Dave Stanley		EPS	6:30am	
6:30	ONSITE GET PERMIT			
7:00	PICK UP HOSES & IBC.			
	SET UP EQUIPMENT			
	TAKE PHOTOS, SOAK TO TANK. — FLUSH SYS		FROM HYDRANT	
1:00PM	START TREATMENT.			
2:00PM	GET PARTS FROM KUTTEN			
3:00PM	RESTART T/M.			
	2ND FLUSH.			
FINISH	5:00PM.			

Signature of supervisor/presenter: _____ **Date:** 7-3-23.

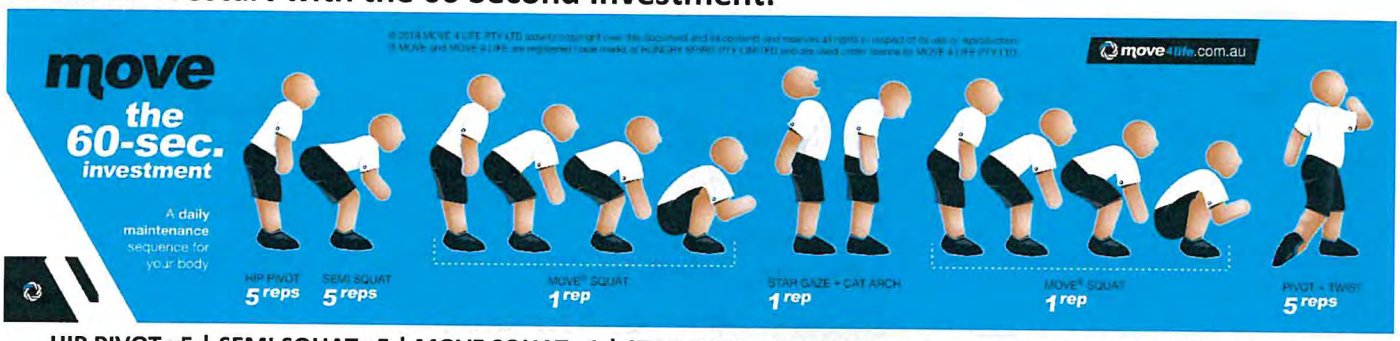
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Project Name: CS Energy **Project No:** 107228/3 **Date:** 8-3-23

Name of supervisor/presenter: Dave Sinclair

Today's Forecast – Max. Temp: 33° **UV Index:** 13. **Wind Speed:** N/E 15/20 **Rainfall:** 70% 0-10mm

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards) Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	Exclusion zone around concrete slab	2. EXCAVATION	—
3. ELECTRICAL & SERVICES	RCD on Generator.	4. WORK AT HEIGHT	—
5. ASBESTOS & DEMOLITION	—	6. CONFINED SPACE & HAZ ATMOSPHERE	—
7. TEMPORARY WORKS	—	8. FITNESS FOR WORK	Well rested and free from the effects of drugs and alcohol
9. ENVIRO SITE MANAGEMENT	Place all rubbish in onsite bins.	10. SOIL & WATER	PFAS contaminated water. Wash hands before eating and drinking.
11. AIR & AMENITY	Control any dust with water suppression	**The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.**	

Items Raised from Yesterday / Previous Meeting

Today's Activities		
Activity	**Key Hazards / Controls**	**SWMS For this Task**
1. TRAFFIC MANAGER WITH WTP.	ELECTRIC SHOCK — RCD ON GENERATOR	SWP
2.	PFAS WATER — CORRECT PPE	
3.	MANUAL HANDLING — CORRECT LIFTING TECHNIQUES	
4.	DUST — DUST MASKS.	
5.	HEAT & HUMIDITY — DRINK PLENTY OF FLUIDS.	
6.		
7.		
8.		

List Permits or additional Training required to carry out today's activities	

Suggestions or comments raised by attendees

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- I have raised any safety issues with the supervisor/presenter before commencing work.
- I am fit for work to perform my tasks/duties today.

COMPLETE TAKE-5 PRIOR TO COMMENCING WORK

Print Name	Signature	Company	Time On Site	Time Off Site
Doug Scanlon		EPS	6.30am	
6.30am	Stripe T/Meant.	3	Edward	
		4	"	
		5	"	
		6	"	
		7	Hydrant	
		8.	Hydrant.	
Clean Bar Filter 3 times.		Last 1 at	4.15pm.	
Set up Cadeo for possible		overnight	Rain.	

Signature of supervisor/presenter: _____ **Date:** 8-3-23

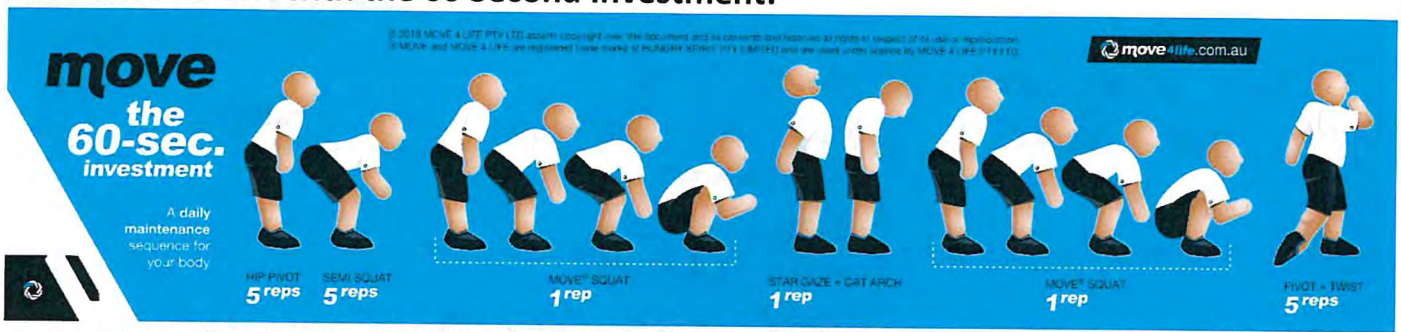
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Project Name: CS Energy **Project No:** 107228 **Date:** 9-3-23

Name of supervisor/presenter: Dave Sorensen

Today's Forecast – Max. Temp: 30° **UV Index:** 12 **Wind Speed:** 15/20 E 90° **Rainfall:** 8-40mm

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards)
Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	Exclusion zone around concrete slab	2. EXCAVATION	—
3. ELECTRICAL & SERVICES	RCD on Compressor	4. WORK AT HEIGHT	—
5. ASBESTOS & DEMOLITION	—	6. CONFINED SPACE & HAZ ATMOSPHERE	—
7. TEMPORARY WORKS	—	8. FITNESS FOR WORK	Well rested and free from the effects of drugs and alcohol
9. ENVIRO SITE MANAGEMENT	Place all rubbish in onsite bins.	10. SOIL & WATER	PFAS contaminated water. Wash hands before eating and drinking.
11. AIR & AMENITY	Control any dust with water suppression	**The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.**	

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Items Raised from Yesterday / Previous Meeting

Today's Activities		
Activity	**Key Hazards / Controls**	**SWMS For this Task**
1. TREAT WATER WEEKLY WTP DO TAKE SAMPLES	ELECTRIC SHOCK — RCD ON GENERATOR	SWP.
2.	PFAS WATER — CORRECT PPE	
3.	MANUAL HANDLING CORRECT LIFTING TECHNIQUES	
4.	HEAT & HUMIDITY DRINK PLENTY OF FLUIDS.	
5.		
6.		
7.		
8.		

List Permits or additional Training required to carry out today's activities	

Suggestions or comments raised by attendees

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- I have raised any safety issues with the supervisor/presenter before commencing work.
- I am fit for work to perform my tasks/duties today.

COMPLETE TAKE-5 PRIOR TO COMMENCING WORK

Print Name	Signature	Company	Time On Site	Time Off Site
Dane Sexton		EPS	6-30am	
6-15 AM ONSITE D/A TESTING.				
FLUSH SLABS WITH HYDRANT. (9).				
START TREATMENT.				
9-15	FLUSH	(10)		
10-30	Chlor Bal Filter	(4)		
10-45	FLUSH	(11)		
12-30	FLUSH	(12)		
	Complete			

Signature of supervisor/presenter: _____ **Date:** 9-3-23

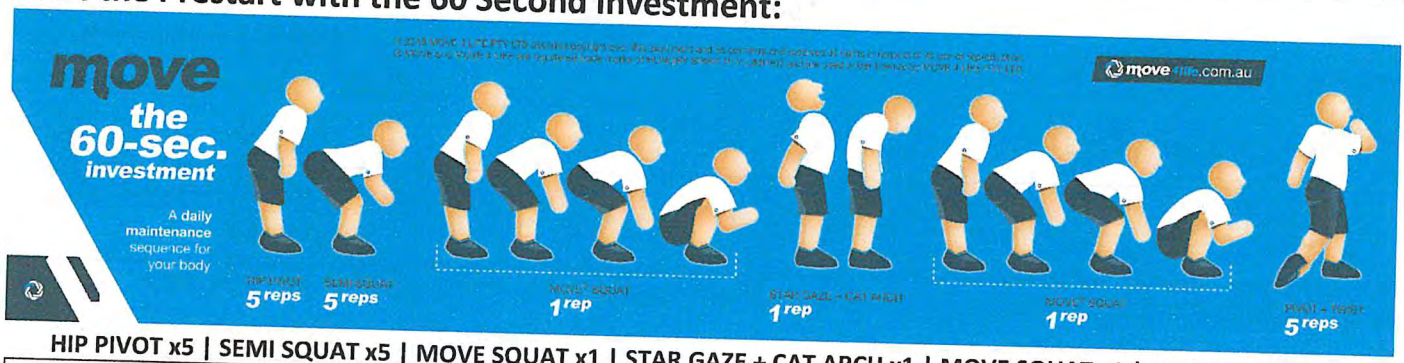
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Project Name CS Energy Callide **Project No: 107223** **Date:** 1-11-22.

Name of supervisor/presenter: Dave Stenholm

Today's Forecast – Max. Temp: 27° **UV Index:** 12 **Wind Speed:** 20-30 NW **Rainfall:** 15-35% 100%

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards)
Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	Plant and person separation. 2-way communications UHF Ch 18	2. EXCAVATION	Stability of plant on stockpiles. Ticketed and competent operators. Zone of influence
3. ELECTRICAL & SERVICES	N/A	4. WORK AT HEIGHT	N/A
5. ASBESTOS & DEMOLITION	N/A	6. CONFINED SPACE & HAZ ATMOSPHERE	N/A
7. TEMPORARY WORKS		8. FITNESS FOR WORK	Free from drugs and alcohol and fatigue management
9. ENVIRO SITE MANAGEMENT	Place all rubbish in bins. Keep site clean and tidy	10. SOIL & WATER	PFAS contaminated soil and water. Wash hands prior to eating and/or drinking
11. AIR & AMENITY	Control dust with water trucks and trailers. Dust masks when needed	**The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.**	

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Items Raised from Yesterday / Previous Meeting

Today's Activities		
Activity	**Key Hazards / Controls**	**SWMS For this Task**
1. SOIL TREATMENT	PLANT / PLANT	PERR COMMS. PRE-COMMENCE OF WORKS.
2. STOCKPILING OF MATERIALS	PEOPLE / PLANT.	SPOTTER RF/WHEN REQUIRED.
3. CRUSHING CONCRETE	EXCLUSION ZONES.	SIGN IN / SIGN OUT LOCK ON / OFF.
4.	DUST, CONTROL WITH WATER WHEN NEEDED.	
5. RAIN & STORMS	NO PLANT OPERATION WHEN STORM & LIGHTNING IN AREA.	
6.		
7. PLANT UNTIL CONCLUDED		
8.		

List Permits or additional Training required to carry out today's activities	
Sign on to PRE-START. LOCK ON LOCK OFF	

Suggestions or comments raised by attendees
TAKE 5's EVERYDAY.

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Attendance record:

- I understand the general site works (activities) presented in this Daily Consultation Briefing and have signed onto the SWMS applicable to my specific task(s).
- I have raised any safety issues with the supervisor/presenter before commencing work.
- I am fit for work to perform my tasks/duties today.

COMPLETE TAKE-5 PRIOR TO COMMENCING WORK

Print Name	Signature	Company	Time On Site	Time Off Site
Dave Graham		EPS	6.00AM.	2.00PM.
JOHN PERRIN		REX	630	8.00AM
Will THORN		REX	630	8.00AM
L MITTELHEUSER		REX	6.30.	8.00AM
BRIAN KNOWLES		REX	6.30	8.00AM.
Shane Cherry		Rex	6.30	8.00AM.
Eric BROWN		REX	6.30	8.00AM
SCOTT BARRY	SKB	EPS	6.30	11.00AM.
QUENTIN YU		EPS	630.	2.00PM.

Signature of supervisor/presenter: _____ **Date:** 31/10/22.

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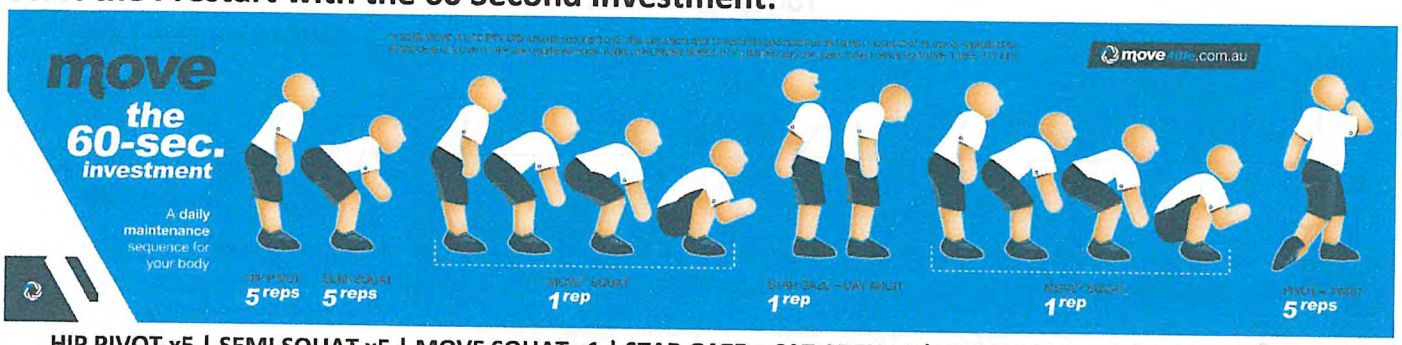
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Project Name: Gawler Bowl **Project No:** 107223 **Date:** 31-10-22

Name of supervisor/presenter: Dave Sneddon.

Today's Forecast – Max. Temp: 35° **UV Index:** 12 **Wind Speed:** Light **Rainfall:** 0%.

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards)
Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	Exclusion Zones 2-Way Comms UHF CH18.	2. EXCAVATION	N/A.
3. ELECTRICAL & SERVICES	N/A.	4. WORK AT HEIGHT	N/A
5. ASBESTOS & DEMOLITION	N/A.	6. CONFINED SPACE & HAZ ATMOSPHERE	N/A.
7. TEMPORARY WORKS	N/A.	8. FITNESS FOR WORK	Well Rested and Free from Drugs and Alcohol.
9. ENVIRO SITE MANAGEMENT	Keep Site and Work Areas Tidy	10. SOIL & WATER	Wash Hands Before Eating and Drinking.
11. AIR & AMENITY	Use Water to Control Dust	The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.	

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Items Raised from Yesterday / Previous Meeting

Today's Activities		
Activity	**Key Hazards / Controls**	**SWMS For this Task**
1. SOIL TREATMENT	PLANT / PLANT POOR COMMS BETWEEN OPERATORS	
2.	PEOPLE / PLANT SPOTTER IF / WHEN REQUIRED.	
3. SPOILPILE RE LOCATE	EXCLUSION ZONES TO SITE CALL IN ON UHF CH 18.	
4. UNLOAD PLANT – 30T EXCAVATOR	COMPETENT OPERATOR CLEARANCE ZONE WHEN UNLOADING.	
5.		
6.		
7.		
8.		

List Permits or additional Training required to carry out today's activities	

Suggestions or comments raised by attendees

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record:

derstand the general site works (activities) presented in this Daily Consultation Briefing and have signed to the SWMS applicable to my specific task(s).
have raised any safety issues with the supervisor/presenter before commencing work.
I am fit for work to perform my tasks/duties today.

COMPLETE TAKE-5 PRIOR TO COMMENCING WORK

Print Name	Signature	Company	Time On Site	Time Off Site
JOHN PEDRAN		REX	10.00	530
LEON MITTELHAUSER		REX	10.00	5.30
BRIAN KNOWLES		REX	10.00.	5.30
WILL THORNE		REX	10.00	5.30
Shane Cherry		Rex	10:00	5.30
Eric BROWN		REX	10.00	530
QUENTIN XU		EPJ.	10:00.	4.30PM.
SCOTT JARRY	SRJ	EPS	10 00	6.00PM
DAVE SHANNON		EPS.	10.00.	6.00PM.

Signature of supervisor/presenter: _____ **Date:** 31-10.22.

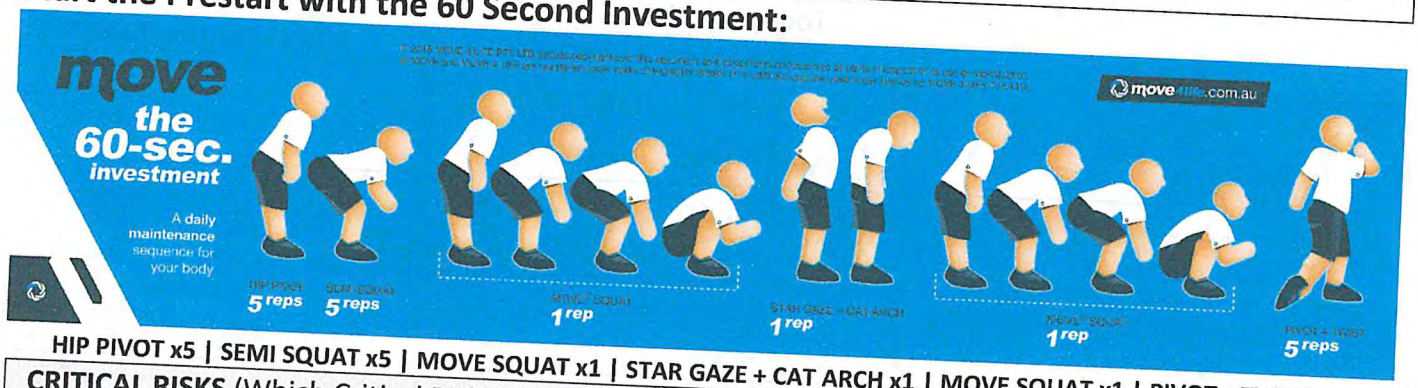
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Project Name CS Energy Callide **Project No: 107223** **Date:** 3/11/22

Name of supervisor/presenter: Dave Stenholm

Today's Forecast – Max. Temp: 26° **UV Index:** 11 **Wind Speed:** WE 15/20 **Rainfall:** 06 0HM.

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards) Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	Plant and person separation. 2-way communications UHF Ch 18	2. EXCAVATION	Stability of plant on stockpiles. Ticketed and competent operators. Zone of influence
3. ELECTRICAL & SERVICES	N/A	4. WORK AT HEIGHT	N/A
5. ASBESTOS & DEMOLITION	N/A	6. CONFINED SPACE & HAZ ATMOSPHERE	N/A
7. TEMPORARY WORKS		8. FITNESS FOR WORK	Free from drugs and alcohol and fatigue management
9. ENVIRO SITE MANAGEMENT	Place all rubbish in bins. Keep site clean and tidy	10. SOIL & WATER	PFAS contaminated soil and water. Wash hands prior to eating and/or drinking
11. AIR & AMENITY	Control dust with water trucks and trailers. Dust masks when needed	**The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.**	

Items Raised from Yesterday / Previous Meeting

Today's Activities

Activity	Key Hazards / Controls	SWMS For this Task
1. Rock Breaking and Crushing.	Plant / Plant Good Comms. Pre-Planning Works.	
2. Soil Conditioning.	Plant / Person Exclusions Zones - Spotter when Required.	
3.		
4.		
5.		
6.		
7.		
8.		

List Permits or additional Training required to carry out today's activities	
Sign on to Pre-Starts Lock on Lock Off.	

Suggestions or comments raised by attendees

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Attendance record:

- I understand the general site works (activities) presented in this Daily Consultation Briefing and have signed onto the SWMS applicable to my specific task(s).
- I have raised any safety issues with the supervisor/presenter before commencing work.
- I am fit for work to perform my tasks/duties today.

COMPLETE TAKE-5 PRIOR TO COMMENCING WORK

Print Name	Signature	Company	Time On Site	Time Off Site
Dave Stenhouse		EPS	6:00AM.	6:00
Scott Barry		EPS	6:00	6:00
John Perrin		REX	600	530
Eric Brown		REX	600	530
L Mittelheuser		REX	6:00	5-30
Shane Cherry		Rex	600	5:30
Brian Knowles		REX	600	530
Will Thorne		REX	600	530

Signature of supervisor/presenter: _____ **Date:** 3/11/22.

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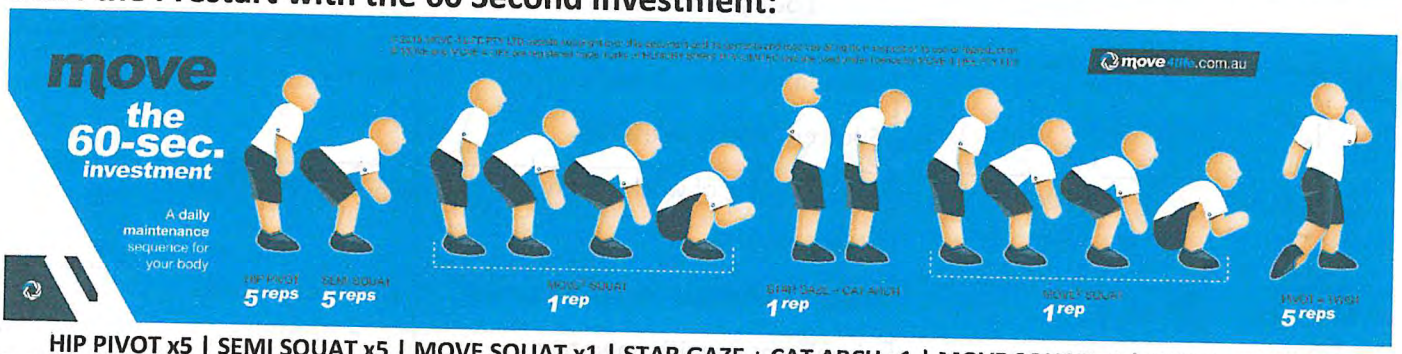
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Project Name CS Energy Callide **Project No: 107223** **Date:** 4/11/22

Name of supervisor/presenter: Dave Stenholm

Today's Forecast – Max. Temp: 28° **UV Index:** 11 **Wind Speed:** S/E 20-30 **Rainfall:** 0E 0mm

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards)
Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	Plant and person separation. 2-way communications UHF Ch 18	**2. EXCAVATION**	Stability of plant on stockpiles. Ticketed and competent operators. Zone of influence
3. ELECTRICAL & SERVICES	N/A	**4. WORK AT HEIGHT**	N/A
5. ASBESTOS & DEMOLITION	N/A	**6. CONFINED SPACE & HAZ ATMOSPHERE**	N/A
7. TEMPORARY WORKS		**8. FITNESS FOR WORK**	Free from drugs and alcohol and fatigue management
9. ENVIRO SITE MANAGEMENT	Place all rubbish in bins. Keep site clean and tidy	**10. SOIL & WATER**	PFAS contaminated soil and water. Wash hands prior to eating and/or drinking
11. AIR & AMENITY	Control dust with water from hoses or trucks. Dust masks when needed	**The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.**	

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Items Raised from Yesterday / Previous Meeting

Today's Activities		
Activity	**Key Hazards / Controls**	**SWMS For this Task**
1. Rock Crushing.	Plant and Plant 2-way comms Spotters when necessary	Working around mobile plant,
2. Mixing Pad with Rock.	Pre planning of works at pre starts, clear instructions	Excavations, Services,
3. Rock Breaking.	Plant and Person exclusion zones, visual contact with operators	Lifting operations
4.		
5.		
6.		
7.		
8.		

List Permits or additional Training required to carry out today's activities	
Sign on to pre starts Complete take 5s	
Lock on Lock off for access to site	

Suggestions or comments raised by attendees

Attendance record:

- I understand the general site works (activities) presented in this Daily Consultation Briefing and have signed onto the SWMS applicable to my specific task(s).
- I have raised any safety issues with the supervisor/presenter before commencing work.
- I am fit for work to perform my tasks/duties today.

COMPLETE TAKE-5 PRIOR TO COMMENCING WORK

Print Name	Signature	Company	Time On Site	Time Off Site
DAVE SEMMENS		EPS	6:00AM.	S-W
JOHN PERRIN		REX	600AM	500
ERIC BROWN		REX	600AM	500
SCOTT BARRY	SRD	EPS	600	5.00
BRIAN KARAMES		REX	600	500
Shane Chevry		Rex	600	500
WILL THOMAS		Rex	600	500
QUENTIN YU		EPS	6:30	S-W
EMILY MADDISON		EPIC	10:00	10:45
Daniel Papinczak	Daniel Papinczak	Epic	10:00	10:45

Signature of supervisor/presenter: _____ **Date:** 4/11/22

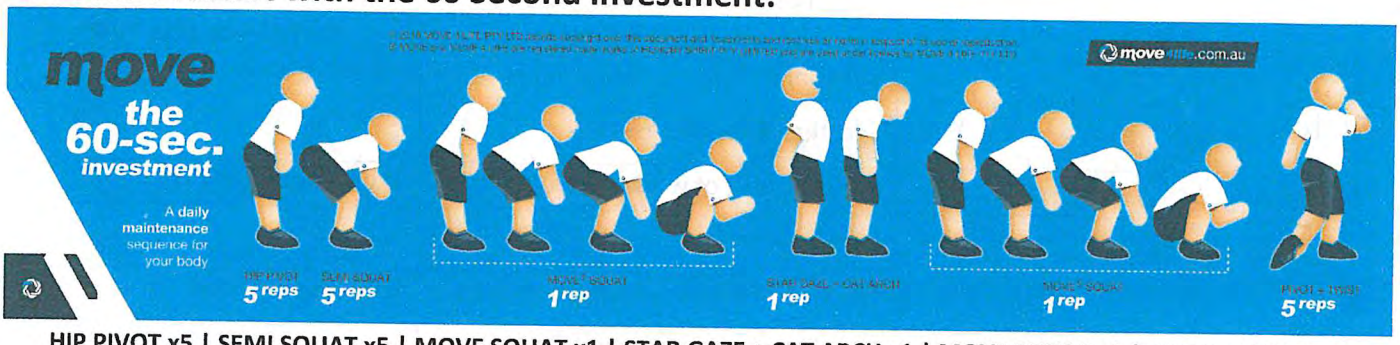
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Project Name CS Energy Callide **Project No: 107223** **Date:** 5/11/22.

Name of supervisor/presenter: Dave Stenholm

Today's Forecast – Max. Temp: 28° **UV Index:** ____ **Wind Speed:** S/E 15/25 **Rainfall:** 0mm. 56

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards) Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	Plant and person separation. 2-way communications UHF Ch 18	2. EXCAVATION	Stability of plant on stockpiles. Ticketed and competent operators. Zone of influence
3. ELECTRICAL & SERVICES	N/A	4. WORK AT HEIGHT	N/A
5. ASBESTOS & DEMOLITION	N/A	6. CONFINED SPACE & HAZ ATMOSPHERE	N/A
7. TEMPORARY WORKS		8. FITNESS FOR WORK	Free from drugs and alcohol and fatigue management
9. ENVIRO SITE MANAGEMENT	Place all rubbish in bins. Keep site clean and tidy	10. SOIL & WATER	PFAS contaminated soil and water. Wash hands prior to eating and/or drinking
11. AIR & AMENITY	Control dust with water from hoses or trucks. Dust masks when needed	**The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.**	

Items Raised from Yesterday / Previous Meeting

Today's Activities		
Activity	**Key Hazards / Controls**	**SWMS For this Task**
1. PRE- MEETING OF F.O.T 3.	Plant and Plant 2-way comms Spotters when necessary	Working around mobile plant,
2. CLEAR MORE MUD ROAD TRACK.	Pre planning of works at pre starts, clear instructions	Excavations, Services,
3.	Plant and Person exclusion zones, visual contact with operators	Lifting operations
4.		
5.		
6.		
7. DISCHARGE ON 23T FIX AIR/CON LOADER.		
8.		

List Permits or additional Training required to carry out today's activities	
Sign on to pre starts Complete take 5s	
Lock on Lock off for access to site	

Suggestions or comments raised by attendees

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Attendance record:

- I understand the general site works (activities) presented in this Daily Consultation Briefing and have signed onto the SWMS applicable to my specific task(s).
- I have raised any safety issues with the supervisor/presenter before commencing work.
- I am fit for work to perform my tasks/duties today.

COMPLETE TAKE-5 PRIOR TO COMMENCING WORK

Print Name	Signature	Company	Time On Site	Time Off Site
Dan Sowden		EPS	6:00am	1 00
JOHN PERRIN		REX	600 AM	100
Eric BROWN		REX	600Am	1:00
JAYSON Postema		Rex	600Am	7:30
Shane Cherry		Rex	6.00	100
Will THORP		Rex	600	100
Brian Knowles		Rex	600	106
Scott Barry	SRB	EPS	600	1 00

Signature of supervisor/presenter: _____ **Date:** 5/11/22

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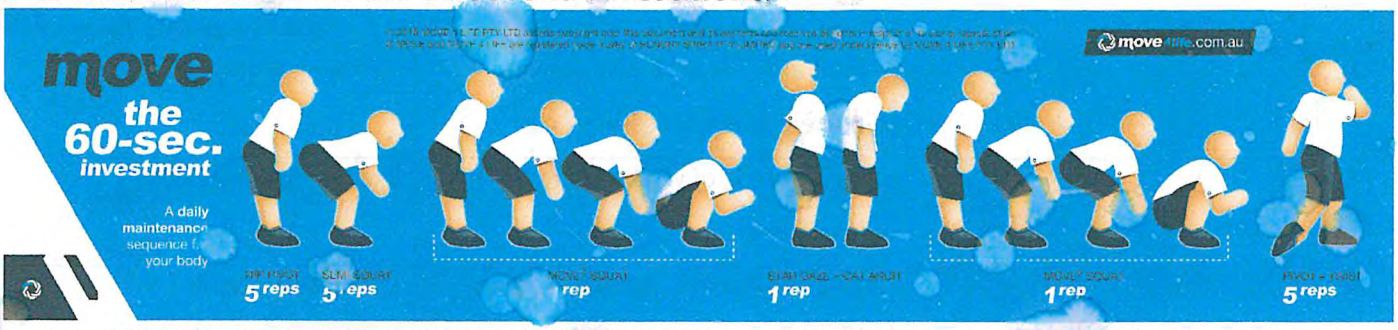
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Project Name CS Energy Callide **Project No: 107223** **Date:** 7-11-22.

Name of supervisor/presenter: Dave Stenholm

Today's Forecast – Max. Temp: 29° **UV Index:** 11 **Wind Speed:** S/E 20/30. **Rainfall:** 5% 0mm.

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards)
Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	Plant and person separation. 2-way communications UHF Ch 18	2. EXCAVATION	Stability of plant on stockpiles. Ticketed and competent operators. Zone of influence
3. ELECTRICAL & SERVICES	N/A	4. WORK AT HEIGHT	N/A
5. ASBESTOS & DEMOLITION	N/A	6. CONFINED SPACE & HAZ ATMOSPHERE	N/A
7. TEMPORARY WORKS		8. FITNESS FOR WORK	Free from drugs and alcohol and fatigue management
9. ENVIRO SITE MANAGEMENT	Place all rubbish in bins. Keep site clean and tidy	10. SOIL & WATER	PFAS contaminated soil and water. Wash hands prior to eating and/or drinking
11. AIR & AMENITY	Control dust with water from hoses or trucks. Dust masks when needed	**The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.**	

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Items Raised from Yesterday / Previous Meeting

Today's Activities		
Activity	**Key Hazards / Controls**	**SWMS For this Task**
1. BACKFILLING FOR 1&2.	Plant and Plant 2-way comms Spotters when necessary	Working around mobile plant,
2. PRE-MIXING AND ROLLING F.O.R 3.	Pre planning of works at pre starts, clear instructions	Excavations, Services,
3.	Plant and Person exclusion zones, visual contact with operators	Lifting operations
4.	Observe speed limits on roads, call up on Uhf CH 18 crossing intersections	
5.	Spotter for reversing Moxy	
6.		
7.		
8. LOAD OUT 30T EXCAVATOR.		

List Permits or additional Training required to carry out today's activities	
Sign on to pre starts Complete take 5s	
Lock on Lock off for access to site	

Suggestions or comments raised by attendees

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Attendance record:

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- I have raised any safety issues with the supervisor/presenter before commencing work.
- I am fit for work to perform my tasks/duties today.

COMPLETE TAKE-5 PRIOR TO COMMENCING WORK

Print Name	Signature	Company	Time On Site	Time Off Site
D STENHOLM		EPS	6:00AM.	6 00
SCOTT BARRY	SRJ	EPS	600AM	1730
JOHN PERRIN		REX	630 AM.	1730
WILL TYLER		REX	6:30	530
LEON MITCHELMORE		REX	6:30	5:30
Shane Cherry		Rex	6.30	5:30
BRIAN KNOWLES		REX	630.	530
Quentin Yu		EPS	630	5 Tou

Signature of supervisor/presenter: _____ **Date:** 7/11/22.

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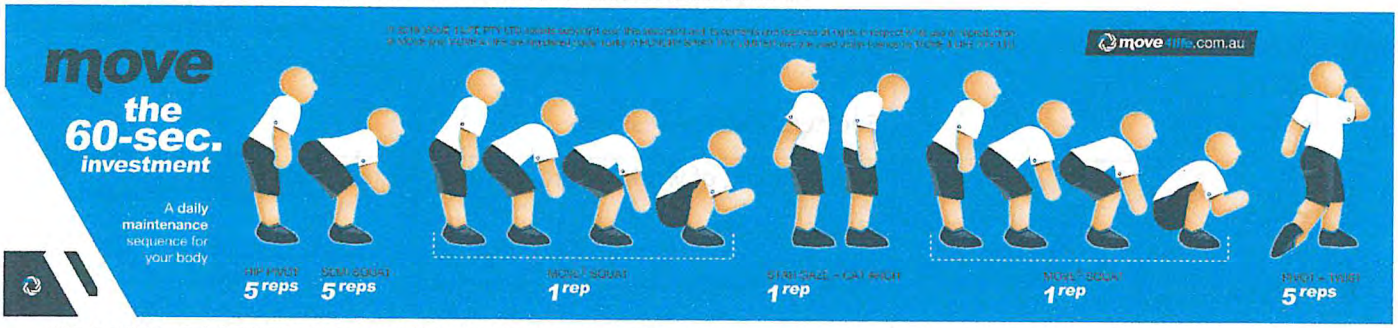
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Project Name CS Energy Callide **Project No: 107223** **Date:** 8/11/22.

Name of supervisor/presenter: Dave Stenholm

Today's Forecast – Max. Temp: 30° **UV Index:** 11 **Wind Speed:** S/E 15/25 **Rainfall:** 5G 0mm.

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards)
Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	Plant and person separation. 2-way communications UHF Ch 18	2. EXCAVATION	Stability of plant on stockpiles. Ticketed and competent operators. Zone of influence
3. ELECTRICAL & SERVICES	N/A	4. WORK AT HEIGHT	N/A
5. ASBESTOS & DEMOLITION	N/A	6. CONFINED SPACE & HAZ ATMOSPHERE	N/A
7. TEMPORARY WORKS		8. FITNESS FOR WORK	Free from drugs and alcohol and fatigue management
9. ENVIRO SITE MANAGEMENT	Place all rubbish in bins. Keep site clean and tidy	10. SOIL & WATER	PFAS contaminated soil and water. Wash hands prior to eating and/or drinking
11. AIR & AMENITY	Control dust with water from hoses or trucks. Dust masks when needed	**The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.**	

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Items Raised from Yesterday / Previous Meeting

Today's Activities		
Activity	**Key Hazards / Controls**	**SWMS For this Task**
1. Reinstate F.O.T 3	Plant and Plant 2-way comms Spotters when necessary	Working around mobile plant,
2. Soil treatment for F.O.T 3.	Pre planning of works at pre starts, clear instructions	Excavations, Services,
3. Backfilling 1 & 2. With water Bentonite.	Plant and Person exclusion zones, visual contact with operators	Lifting operations
4. Carting with Moxy.	Observe speed limits on roads, call up on Uhf CH 18 crossing intersections	
5.	Spotter for reversing Moxy	
6.		
7.		
8.		

List Permits or additional Training required to carry out today's activities	
Sign on to pre starts Complete take 5s	
Lock on Lock off for access to site	

Suggestions or comments raised by attendees

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- I have raised any safety issues with the supervisor/presenter before commencing work.
- I am fit for work to perform my tasks/duties today.

COMPLETE TAKE-5 PRIOR TO COMMENCING WORK

Print Name	Signature	Company	Time On Site	Time Off Site
Dave Sharman		EPS.	6.00AM.	5.30PM
JOHN PERRIN		REX	600AM.	1730
WILL THORLEY		REX	600	1730
Lyn Hellcoat		REX	6.00	5.30
Shane Cherry		Rex	600	5.30
Scott Barry	SRB	EPS	600	1730
BRIAN KNOWLES		REX	600.	530.
Mark Dobson		C.S.	07.30.	14.00
Thomas Little		Coates Hire	0900	1100

Signature of supervisor/presenter: _____ **Date:** 8/11/22.

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This document is uncontrolled when printed, refer to the Integrated Management System (IMS) for current version of all documents

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	9/11/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA.
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	7AM
End time	4PM.
Hours of actual treatment undertaken	
Volume of Material treated	505T
Tonnes per hour achieved	
Volume of PAC used	2.5T (5 BAGS)
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	4 SAMPLES.

Sampling Log			
#	**Sample ID**	**Stockpile Location**	**Sample time**
1	FOT A3 SP5 TREATED 1	STOCKPILE AREA	9AM
2	FOT A3 SP5 TREATED 2	STOCKPILE AREA	11AM
3	FOT A3 SP5 TREATED 3	STOCKPILE AREA	1PM
4	FOT A3 SP5 TREATED 4	STOCKPILE AREA	3PM.
5			
6			
7			
8			
9			
10			

Notes (plant issues, downtime, etc.)

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	10/11/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	
End time	
Hours of actual treatment undertaken	
Volume of Material treated	100ST
Tonnes per hour achieved	
Volume of PAC used	2.5T (5 BAGS)
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	

Sampling Log			
#	**Sample ID**	**Stockpile Location**	**Sample time**
1	FOT A3 SP4 TREATED 1	STOCKPILE AREA	
2	FOT A3 SP4 TREATED 2	STOCKPILE AREA	
3	FOT A3 SP3 TREATED 1	STOCKPILE AREA	
4	FOT A3 SP3 TREATED 2	STOCKPILE AREA	
5	FOT A3 SP2 TREATED 1	STOCKPILE AREA	
6	FOT A3 SP2 TREATED 1 DUP	STOCKPILE AREA	
7	FOT A3 SP2 TREATED 2	STOCKPILE AREA	
8	FOT A3 SP1 TREATED 1	STOCKPILE AREA	
9	FOT A3 SP1 TREATED 2	STOCKPILE AREA	
10	FOT A3 SP1 TREATED 3	STOCKPILE AREA.	

Notes (plant issues, downtime, etc.)

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	25/10/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	ROCK
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	6AM
End time	5PM.
Hours of actual treatment undertaken	
Volume of Material treated	185T
Tonnes per hour achieved	200 m^3/h.
Volume of PAC used	0.93T
Actual % PAC Addition Achieved	0.5%.
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	2

Sampling Log

#	Sample ID	Stockpile Location	Sample time
1	FOT AREA 1 SP5 TREATED 1	STOCKPILE AREA	2PM
2	FOT AREA 1 SP5 TREATED 2	STOCKPILE AREA	3PM
3	FOT AREA 1 SP4 TREATED 1	STOCKPILE AREA	9AM
4	FOT AREA 1 SP4 TREATED 2	STOCKPILE AREA	7AM
5	FOT AREA 1 SP4 TREATED 3	STOCKPILE AREA	9AM
6	FOT AREA 1 SP4 TREATED 4	STOCKPILE AREA	12PM
7	FOT AREA 1 SP4 TREATED 5	STOCKPILE AREA	2PM
8			
9			
10			

Notes (plant issues, downtime, etc.)
FIRST DAY OF TREATMENT

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	26/10/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	6AM
End time	5PM
Hours of actual treatment undertaken	
Volume of Material treated	780T
Tonnes per hour achieved	
Volume of PAC used	3.92T
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	5 SAMPLES.

Sampling Log			
#	**Sample ID**	**Stockpile Location**	**Sample time**
1	FOT AREA 1 SP4 TREATED 1	STOCKPILE AREA	7AM
2	FOT AREA 1 SP4 TREATED 2	STOCKPILE AREA	9 AM
3	FOT AREA 1 SP4 TREATED 3	STOCKPILE AREA	12 PM
4	FOT AREA 1 SP4 TREATED 4	STOCKPILE AREA	2 PM
5	FOT AREA 1 SP4 TREATED 5	STOCKPILE AREA	4PM.
6			
7			
8			
9			
10			

Notes (plant issues, downtime, etc.)

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	27/10/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA.
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	ROCK
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	6AM
End time	1PM.
Hours of actual treatment undertaken	
Volume of Material treated	106 T
Tonnes per hour achieved	
Volume of PAC used	0.56T
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	1 SAMPLE

Sampling Log			
#	**Sample ID**	**Stockpile Location**	**Sample time**
1	FOT AREA 1 SP3 TREATED	STOCKPILE AREA.	10AM.
2			
3			
4			
5			
6			
7			
8			
9			
10			

Notes (plant issues, downtime, etc.)
BREAKDOWN - GEARBOX HAD NO SUMP PLUG

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	28/10/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	ROCK
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	10AM
End time	5PM.
Hours of actual treatment undertaken	
Volume of Material treated	456T
Tonnes per hour achieved	
Volume of PAC used	2.29T
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	3 SAMPLES.

Sampling Log			
#	**Sample ID**	**Stockpile Location**	**Sample time**
1	FOT AREA1 SP2 TREATED 1	STOCKPILE AREA	11AM
2	FOT AREA 1 SP2 TREATED 2	STOCKPILE AREA	1PM
3	FOT AREA 1 SP2 TREATED 3.	STOCKPILE AREA	3PM.
4			
5			
6			
7			
8			
9			
10			

Notes (plant issues, downtime, etc.)
REPAIRED GEARBOX. - UP RUNNING BEFORE MIDDAY

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	31/10/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	ROCK
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	6AM
End time	5PM.
Hours of actual treatment undertaken	
Volume of Material treated	391.57T
Tonnes per hour achieved	
Volume of PAC used	1.97T
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	3 SAMPLES.

Sampling Log			
#	**Sample ID**	**Stockpile Location**	**Sample time**
1	FOT AREA 1 SP3 TREATED 2	STOCKPILE AREA	10AM
2	FOT AREA 1 SP3 TREATED 3	STOCKPILE AREA	1PM
3	FOT AREA 1 SP3 TREATED 3 DUP.	STOCKPILE AREA.	3PM.
4			
5			
6			
7			
8			
9			
10			

Notes (plant issues, downtime, etc.)

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	2/11/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	ROCK
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	6AM
End time	5PM.
Hours of actual treatment undertaken	
Volume of Material treated	662T
Tonnes per hour achieved	
Volume of PAC used	3.32T
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	4 SAMPLES

Sampling Log			
#	**Sample ID**	**Stockpile Location**	**Sample time**
1	FOT AREA 2 SP1 TREATED 1	STOCKPILE AREA	9AM.
2	FOT AREA 2 SP1 TREATED 2	STOCKPILE AREA	11AM.
3	FOT AREA 2 SP1 TREATED 3	STOCKPILE AREA	1PM
4	FOT AREA 2 SP1 TREATED 4	STOCKPILE AREA	3PM.
5			
6			
7			
8			
9			
10			

Notes (plant issues, downtime, etc.)

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	2/11/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	ROCK
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	6AM
End time	5PM
Hours of actual treatment undertaken	
Volume of Material treated	294T (FTG)
Tonnes per hour achieved	
Volume of PAC used	1.48T
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	2 SAMPLES.

Sampling Log			
#	**Sample ID**	**Stockpile Location**	**Sample time**
1	FTG SP1 TREATED 1	STOCKPILE AREA	2 PM
2	FTG SP1 TREATED 2	STOCKPILE AREA	4 PM.
3			
4			
5			
6			
7			
8			
9			
10			

Notes (plant issues, downtime, etc.)

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	3/11/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	ROCK
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	6AM
End time	3PM.
Hours of actual treatment undertaken	
Volume of Material treated	1080T
Tonnes per hour achieved	
Volume of PAC used	6T
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	10 SAMPLES

Sampling Log

#	Sample ID	Stockpile Location	Sample time
1	FTG SP1 TREATED 1	STOCKPILE AREA	7AM
2	FTG SP1 TREATED 2	STOCKPILE AREA	8AM
3	FTG SP1 TREATED 3	STOCKPILE AREA	9AM
4	FTG SP2 TREATED 1	STOCKPILE AREA	10AM
5	FTG SP2 TREATED 2	STOCKPILE AREA	11AM
6	FTG SP2 TREATED 3	STOCKPILE AREA	12PM
7	FTG SP2 TREATED 4	STOCKPILE AREA	1PM
8	FTG SP2 TREATED 5	STOCKPILE AREA	2PM
9	FTG SP2 TREATED 6	STOCKPILE AREA	3PM
10	FTG SP2 TREATED 6 DUP	STOCKPILE AREA	3PM.

Notes (plant issues, downtime, etc.)
COMPLETED FTG AREA SP 1 & SP 2.

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	3/11/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	ROCK
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	3PM
End time	5PM.
Hours of actual treatment undertaken	
Volume of Material treated	169T
Tonnes per hour achieved	
Volume of PAC used	1T
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	1 SAMPLE

Sampling Log			
#	**Sample ID**	**Stockpile Location**	**Sample time**
1	FOT AH TREATED 1	STOCKPILE AREA	4PM.
2			
3			
4			
5			
6			
7			
8			
9			
10			

Notes (plant issues, downtime, etc.)

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	7/11/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA.
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	9AM.
End time	3PM.
Hours of actual treatment undertaken	
Volume of Material treated	363T
Tonnes per hour achieved	
Volume of PAC used	
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	3 SAMPLES.

Sampling Log

#	Sample ID	Stockpile Location	Sample time
1	FOT A3 SP6 TREATED 1	STOCKPILE AREA	10 AM
2	FOT A3 SP6 TREATED 2	STOCKPILE AREA	12 PM
3	FOT A3 SP6 TREATED 3	STOCKPILE AREA	2 PM
4			
5			
6			
7			
8			
9			
10			

Notes (plant issues, downtime, etc.)

Stockpile and Sample location diagram

INSPECTION AND TEST REPORT 02
SOIL TREATMENT AND SAMPLING LOG

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715		
Prepared by		**Date**	3/11/22

Soil Treatment Log	
Stockpile location before treatment	STOCKPILE AREA.
Nominal % PAC to be added (% of weight)	0.5%
Any special considerations for treatment (moisture / rock / clay content / other concrete / sticks / debris)	
Pug Mill Used	~~Precision Screen~~ TELEMIX
Start time	7AM
End time	4PM.
Hours of actual treatment undertaken	
Volume of Material treated	387T
Tonnes per hour achieved	
Volume of PAC used	
Actual % PAC Addition Achieved	
Tonnes per hour achieved	
Stockpile location after treatment	See Page 2 – Treatment Area
Number of laboratory samples taken	3 SAMPLES.

Sampling Log			
#	**Sample ID**	**Stockpile Location**	**Sample time**
1	FOT A3 SP6 TREATED 4	STOCKPILE AREA	10AM
2	FOT A3 SP6 TREATED 5	STOCKPILE AREA	12PM
3	FOT A3 SP6 TREATED 6	STOCKPILE AREA	2PM.
4			
5			
6			
7			
8			
9			
10			

Notes (plant issues, downtime, etc.)

Stockpile and Sample location diagram

Safety Alert 51 – Pump Troubleshooting – Chemical Burn

October 2022

The Incident

An Enviropacific employee received chemical burns to his arms and torso when he was sprayed with a chemical while troubleshooting a malfunctioning pump.

The employee and his offsider were pumping out a chemical tank during a facility decommissioning.

The work (troubleshooting the malfunctioning pump) was beyond the scope of work assigned to them by their supervisor. The work was not covered by a Safe Work Method Statement and was not appropriately risk assessed.

The employee was not wearing the PPE appropriate to the task.

What Every Work Team Need to Consider

- People should only undertake work specifically assigned to them by their supervisor or work their supervisor has given them authority to undertake.
- Supervisors are primarily responsible for planning work and for ensuring that the hazards associated with the work are understood and that appropriate controls are applied.
- A Safe Work Method Statement or a Safe Work Procedure must be prepared and used for any activity involving the use or handling of a hazardous substance.
- If problems occur with the plant or equipment people are using, they must consult their supervisor before they attempt to troubleshoot the problems or put in place remedial actions
- When assigning tasks, supervisors must be clear on what is included in the task and when work must be paused so that further consultation or risk assessments can be undertaken
- The requirements for planning and undertaking work are covered in the Creating Safe Work procedure
- Work groups should take the opportunity to refresh their understanding of the procedure
- Here is a link to the procedure Link

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PRESENTER: Dave Sorensen	**ROLE:** Site Manager
PROJECT: Callide Power.	**PROJECT NO:** 107223
DURATION: 30 mins.	**DATE:** 4-11-22.

PERSONS PRESENT

Print Name	Signature	Print Name	Signature
Dave Sorensen			
John Perdin			
Eric Brown			
Shane Chevis			
Will Thorpe			
Brian Knowles			
Scott Barry			
Quentin Ku			

COMMENTS AND POINTS RAISED

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Safety Alert 50 – Working With Hazardous Substances

6 October 2022

The Incident

An Enviropacific employee received severe chemical burns to his hands while using a caustic-based paint stripper. The burns resulted in hospitalisation and skin grafts.

Neither the injured person nor his supervisor fully appreciated the potential consequences of skin contact with the paint stripper.

Use of the paint stripper was not included on the *Safe Work Method Statement* (SWMS) for the work, nor was there a *Safe Work Procedure* (SWP) for the task. Accordingly, the supervisor did not specify the correct Personal Protective Equipment (PPE) when assigning the task to the worker.

The correct PPE to be used as specified by the *Safety Data Sheet* (SDS) included nitrile gloves and chemical goggles as a minimum.

What Every Work Team Need to Consider

- The Enviropacific HSEQ Management System requires every project or Fixed Facility to have a *Hazardous Substances Register*. Is there a *Hazardous Substances Register* for your Project? If so, does it include every hazardous substance being used on site?
- A copy of the SDS for every hazardous material being used on site must be available to all people working on site. Do you know how to access the SDS for the materials on your site? Is the list of available SDS complete?
- The HSEQ Management System also requires any work involving the handling or use of a hazardous substance must be governed by either a SWMS or a SWP, and these must specify the correct PPE for the task.
- Prior to works commencing, workers must be instructed on the safe use, handling, transport, and storage of any hazardous substances that may be used or encountered.
- Is there a SWMS or a SWP at your site for every task involving the handling or use of hazardous substances?
- A 'Near Miss' incident must be logged in Gensuite if the answer to any of these questions is 'no'. Corrective Actions must also be logged and completed.

Requirements for the purchase, storage and use of hazardous substances is covered in the *Hazardous Substance Procedure* in the HSEQ Management System. A copy of the procedure can be found on MyEnviro.

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PRESENTER:	QUENTIN XU	ROLE:	SITE ENGINEER
PROJECT:	CALLIDE CS ENERGY	PROJECT NO:	107223
DURATION:	30 MINS	DATE:	12/10/22

PERSONS PRESENT

Print Name	Signature	Print Name	Signature
Leon Mittelhauser			
Will Thorpe			
Boyd Cook			
BRIAN KNOWLES			
Shane Cherry			
Scott BARRY			
Peter Lostigan			

COMMENTS AND POINTS RAISED

- DISCUSSION ABOUT CHEMICALS USED ONSITE
- ANY CHEMICALS THAT YOU ARE UNSURE ABOUT, FIND SDS & CONFIRM W/ TEAM.
- PPE.

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Site / Project: CS ENERGY CALLIDE 107223	Date: 03/10/2022

Topics Covered: National Safe Work Month 2022 – Week 1 – Injuries at Work

SAY: Each year October is *National Safe Work Month*, a time to commit to building safe and healthy workplaces for all Australians. This year the theme is "*Know safety, work safely.*" and this week we look at **"Injuries at Work".**

Every worker has a right to go to work each day, knowing they'll come home safely.

We always strive to achieve

Zero Injury

Zero Incident

Zero Harm

There are various types of work-related injuries, including:

- Musculoskeletal disorders
- Wounds and cuts
- Burns
- Fractures
- Psychological injuries

In 2019-20 88% of serious claims were for injuries and musculoskeletal disorders.

Regionally in Enviropacific our top three injuries are related to:

- Hit by moving object
- Fall on same level
- Muscular stress/foot pain

All workplaces have hazards that need to be identified and risks that need to be managed to keep all workers safe.

It is helpful to think through work processes or situations to identify what could potentially go wrong, noting any hazards, risks and control measures identified as you work through the situation.

For all those risks identified, control measures should be implemented in line with the hierarchy of control measures to eliminate, reduce the risk so far as reasonably practicable.

Every employee is to actively look out for their colleagues. If they observe safe behaviours, they should offer positive reinforcement and encouragement (e.g., verbal praise). However, if they observe at-risk work behaviour, they should not hesitate to intervene immediately.

Work together to find a safer solution

Agree on a safer way of performing the task

Commit to working safely

Create and empowered and positive culture where everyone has a **mindset of identifying, reporting and mitigating hazards and caring for one another.**

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DISCUSSION: Ask the workgroup "*What do they see as their highest risk injuries at work?*"

DISCUSSION: Ask the workgroup "*How do they report high risks? How do they mitigate/eliminate/control high risk on site? Do they always report unsafe risks/behaviours?*"

SAY:

Instead of taking action only after an accident has occurred, this approach emphasises proactively identifying at-risk behaviours. This means that hazardous situations can be avoided before they occur, leading to a reduction in near-miss incidents and workplace injuries.

All work groups are expected to develop a work environment where unsafe behaviors are NOT tolerated

All work group members are expected to intervene on unsafe acts

Setting and continuously reinforcing HSEQ expectations is critical for incident-free performance.

Support an environment where ALL injuries or suspected injuries are reported promptly

DISCUSSION: *What are some ways that you can ensure your job is made safe*

SAY: A few items to consider include

Every job has SWP and PTA/SWMS

Take 5

Follow PPE requirement

Notify permit issuer if job scope change

Follow HSEQ requirement

Report all near miss

Escalate any concern immediately

Jobs under observation

Maintain good housekeeping

Everyone Has The Right To Be Safe At Work
Safety is a responsibility shared by everyone

Injuries at work

Presenter:	QUENTIN XU

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People Present		
Print Name	Job Title	Signature
Leon Mittelhauser	REX/Operator	
Will THORNE	OPERATOR	
Boyd Cook	operator	
Shane Cherry	labourer	
BRIAN KNOWLES	OPERATOR.	
Peter Costigan	Supervisor	
Scott BARRY	C/HAND	
ADRIAN SCOTT	REM OPS MAN	

Comments and points raised:

Feedback received:

Corrective Action	Action by	Action Complete	
		Sign off	Date

Key contacts (Remember, If a life is in danger, always call 000):

- Welcome | Safe Work Australia
- Home page | WorkSafe Victoria
-

TYPE
☐ SWMS/Risk Review ☐ Incident Review ☐ Work Change ☐ Safety Alert ☐ Purchasing ☐ Training
☐ Senior Management Visit ☐ Site Rules ☑ Other SUSTAINABILITY

Presenter: QUENTIN XU	Role: SITE ENG
Project: 107223	Job No.
Duration: 30 MINS	Date: 06/10/22

Persons Present

Print Name	Signature	Print Name	Signature
[illegible] THORNE			
[illegible]			
Boyd Cook			
Shane Cherry			
BRIAN [illegible]			
Peter Costigan			
Scott BARRY			

Comments and points raised:
- RECYCLING
- 2030 ZERO WASTE / CARBON EMISSION
- SOLAR PANELS & WIND FARMS.
- SUSTAINABILITY

Feedback received:

Corrective Action	Action by	Action Complete	
		Sign off	Date

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TOOLBOX TALK 06/10/22

Topics discussed

- **Environmental, Sustainability and recycling**
- **2030 Zero waste** – what are we currently doing to minimise the waste we generate going to landfill?
- All the cans, bottles that we dispose of, are they going to recycling or straight into the bin? There is also 10c claim back for every bottle that you dispose of.
- What are you doing at home that could minimise the amount of waste going into landfill?
- **Example** – Victorians are using colour coded four bin to further minimise waste into landfill. Purple lid – glass, FOGO – lime green lid, mixed recycling – yellow lid, household rubbish – red lid.
- **Alternative energy** – what other sources of energy can we use now they have mentioned the coal fire power stations are scheduled to close 2030-2035. Wind farms and Solar Energy/Solar panels. More implementation of these are becoming more evident but will it be enough to power cities and large mines/industries?

F.T.G EXCAVATION WORKS.

TYPE
☐ SWMS/Risk Review ☐ Incident Review ☐ Work Change ☐ Safety Alert ☐ Purchasing ☐ Training
☐ Senior Management Visit ☑ Site Rules ☑ Other _____

Presenter: Peter Costigan	Role: Supervisor
Project: Collide Power - C.S. Energy	Job No. 107223
Duration: 30mins	Date: 22/9/22.

Persons Present

Print Name	Signature	Print Name	Signature
Scott Barry			
Will Thorpe			
Boyd Cook			
Brian Knowles			
Leon Mittelheuser			
Shane Cheers			
Quentin XV			

Comments and points raised:

- Protocols associated with Excavation Works
- P.P.E Requirements
- People / Plant - Exclussion Zones - Stockpiles.

Feedback received:

Corrective Action	Action by	Action Complete	
		Sign off	Date

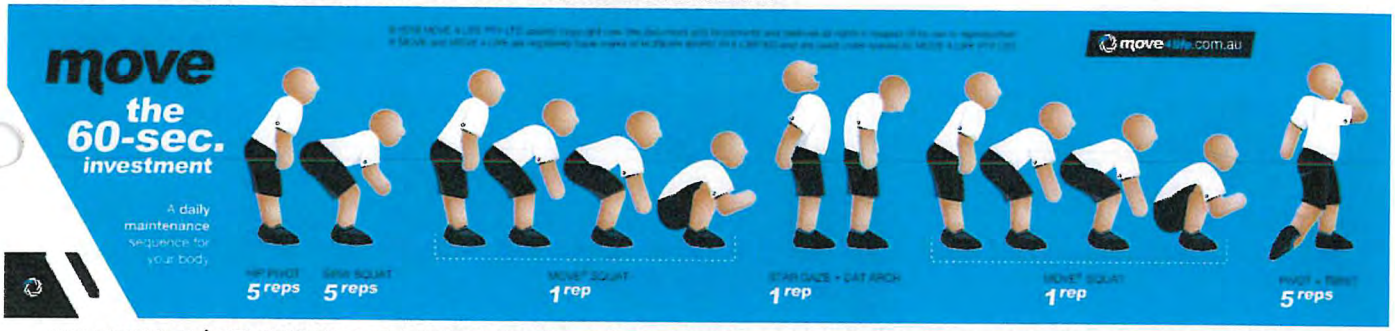
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Project Name: B. Collide Power **Project No:** 107233 **Date:** 22/9/22.

Name of supervisor/presenter: P.C - TOOL BOX DISCUSSION

Today's Forecast – Max. Temp: _____ **UV Index:** _____ **Wind Speed:** _____ **Rainfall:** _____

Start the Prestart with the 60 Second Investment:



HIP PIVOT x5 | SEMI SQUAT x5 | MOVE SQUAT x1 | STAR GAZE + CAT ARCH x1 | MOVE SQUAT x1 | PIVOT + TWIST x 5

CRITICAL RISKS (Which Critical Risks are present for today's activities – Review Key Minimum Standards)
Discuss and review in conjunction with 'Line of Site' board on projects

Critical Risk	Key Controls	Critical Risk	Key Controls
1. TRAFFIC, PLANT AND PEOPLE	✓	2. EXCAVATION	✓
3. ELECTRICAL & SERVICES	✓	4. WORK AT HEIGHT	
5. ASBESTOS & DEMOLITION		6. CONFINED SPACE & HAZ ATMOSPHERE	
7. TEMPORARY WORKS		8. FITNESS FOR WORK	✓
9. ENVIRO SITE MANAGEMENT	✓	10. SOIL & WATER	✓
11. AIR & AMENITY	✓	**The requirements of all Minimum Standards must be implemented in all Enviropacific Workplaces.**	

TOOL BOX DISCUSSION -

Items Raised from Yesterday / Previous Meeting
PART OF TOOL BOX - EXCAVATION FTG.

Today's Activities		
Activity	**~~Key Hazards~~ / Controls**	**SWMS For this Task**
1. Barrier Around Site	- Must be Signed + LOCKED ON	SWMS - EPS
2. P.P.E	- CLOSED CABIN DOORS - DUST CONTROL WHEN REQUIRED	
3.	- MANDATORY P.P.E ON GROUND.	
4. DELINIATION.	- CAUTION TAPE - INDICATES 1000m O/S TO KNOWN SERVICES.	
5.	- DANGER - TAPE - NO ACCESS UNLESS LOCKED ON TO PERMIT.	
6. PLANT.	- MAIN ROUTE TO TIP POINT - SPOTTER / 2WAY COMMS / BOSS COMMS	
7. EXCLUSION ZONE	- NO ONE WITHIN SWING ZONE OF EXC - USE BOLLARD SYSTEM	
8. - SELF INTEREST	- BOSS COMM's - PLAN TASK. - STOP WORK IF UNSURE / ASK QUESTION	

List Permits or additional Training required to carry out today's activities	
9. KEEP AREA CLEAN / TIDY AS WORKS PROGRESS.	
10 - ENVIRO CONTROLS - CONTINUALLY CHECK / INSTALL.	

Suggestions or comments raised by attendees
11 - MUST COMPLETE 2X2 PRIOR TO WORKS / CHANGE 2X2 WHEN CHANGE OCCURS ONSITE.
12 - FITNESS TO WORK.

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Hold Point Release No:	02		
Project Name:	CS Energy Callide Power Station	**Project No:**	107259
Client Name:	CS Energy	**Date:**	30/08/2023
Lot No/Area:	FTG		

DESCRIPTION OF HOLD POINT RELEASE
Additional Remediation Area Extent – Additional excavation of roughly 100m3 of the FTG base for
further treatment due to failed results.
EPS and CS Energy conducted Survey to calculate an average of floor height and calculate volume based
On the remediation area listed below.
Volume calculated to be 86m3 (15m x 13m x 0.445m)

ACTION
The above works have been completed and Enviropacific Services requests CS Energy to release the hold point.

SITE VERIFICATION		
EPS Supervisor/Engineer	Name:	Quentin Xu
	Signature:	
	Date:	30/08/2023
Superintendents client representative/inspector	Name:	Ken Birleson
	Signature:	
	Date:	30/08/2023
EPS Project Manager	Name:	Jack Findlay
	Signature:	
	Date:	04/09/2023

Completed forms are to be scanned and saved to the project file.



String Line Average Depth = 0.445m
Total Volume of Excavation = 86m3

HOLD POINT RELEASE FORM

Hold Point Release No:	02		
Project Name:	CS Energy Callide Power Station	**Project No:**	107259
Client Name:	CS Energy	**Date:**	30/08/2023
Lot No/Area:	FTG		

DESCRIPTION OF HOLD POINT RELEASE
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further treatment due to failed results**.**
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The above works have been completed and Enviropacific Services requests CS Energy to release the hold point.

SITE VERIFICATION		
EPS Supervisor/Engineer	Name:	Quentin Xu
	Signature:	
	Date:	30/08/2023
Superintendents client representative/inspector	Name:	Ken Birleson
	Signature:	
	Date:	30/08/2023
EPS Project Manager	Name:	
	Signature:	
	Date:	

Completed forms are to be scanned and saved to the project file.



String Line Average Depth = 0.445m
Total Volume of Excavation = 86m3

Project title: CS Energy – Callide Power Plant			**Project No:** 107259	
Description of activity: Site setup, removal of concrete bund, remediation earthworks, temporary stockpiling, soil treatment, reinstatement & compaction		**Contract No/Ref:**	**ITP No.** 1	**Rev No.** 0
Location for inspection/testing: CS Energy Callide Power Station, 959 Biloela Callide Road, Mount Murchison QLD 4715			**Lot No:**	
ITP prepared by: Quentin Xu	**Date: 03/08/2023**	**ITP approved by:**	**Name:**	**Date:**

ID #	Process Step	Stage / Frequency	State Quality Acceptance Criteria:	Inspection Test Procedure	Records of Inspection or Test (s)	Inspection/Test Responsibility			Date Inspected*	Comments or NCR	Signed (EPS)	Client Signed (if client witness point)
						Worker /Work group	EPS	Client				
1.	Project plans	Before mobilising	Project plans reviewed & approved by client		Approvals from client ITP sign off		H	R, H	8/08/23			
2.	Site inductions	Commencement	Client & EPS induction completed		Induction certificates / register ITP sign off		D	W	15/08/23			
3.	Pre works survey	Before works	Work areas surveyed to verify original levels		Survey result ITP sign off		H	H	17/08/23			
4.	Dilapidation photos	Before works	Document initial condition of the work areas and transport routes by taking photos		Photos ITP sign off		H, D	W	15/08/23.			
5.	Permit To Work	Before breaking ground	Permit to work completed & signed before breaking ground or driving star pickets		Permit to work documentation ITP sign off		D	D	15/08/23.			

ID #	Process Step	Stage / Frequency	State Quality Acceptance Criteria:	Inspection Test Procedure	Records of Inspection or Test (s)	Inspection/Test Responsibility			Date Inspected*	Comments or NCR	Signed (EPS)	Client Signed (if client witness point)
						Worker /Work group	EPS	Client				
6.	Disposal of Concrete Bund	On going	Waste Classification Letter and Land Fill Acceptance form, Waste Transport Certificates all approved		ITP Sign off, WTC		H,D	H	22/08/23			
7.	Excavation and stockpiling works	Ongoing	Material movements tracked, loads counted, and stockpiles identified		ITR01		D	W	22/08/23	2 STOCKPILES		
8.	Validation of excavations	Completion of excavation	Client to take validation samples from excavations		Laboratory certificates ITP sign off		D	W	22/08/23	FURTHER EXCAVATION & SAMPLING		
9.	Excavation survey	After validation	Excavations surveyed to verify volumes		Survey result ITP sign off		H	W	22/08/23	FLOOR SURVEY AFTER EXCAVATION		
10.	Soil treatment works	Ongoing	Untreated soil stockpiles sampled at rate of 1:250m3 of insitu soil volume + 1:10 ratio for duplicate QA/QC samples Soils treated with 0.5% PAC Treated soil stockpiles sampled at rate of 1:100m3 of insitu soil volume + 1:10 ratio for duplicate QA/QC samples Laboratory results proving at least 95% reduction in the sum of leachable PFHxS & PFOS Soils mixed with 2% bentonite after confirmed to meet criteria		Laboratory certificates ITR02 ITP sign off		H	H	24/08/23			

This document is uncontrolled when printed, refer to the Integrated Management System (IMS) for current version of all documents

ID #	Process Step	Stage / Frequency	State Quality Acceptance Criteria:	Inspection Test Procedure	Records of Inspection or Test (s)	Inspection/Test Responsibility			Date Inspected*	Comments or NCR	Signed (EPS)	Client Signed (if client witness point)
						Worker /Work group	EPS	Client				
11.	Application of PAC to base of excavations	Before backfilling	Application of PAC to base surfaces of all excavation areas at rate of 20kg of PAC per 100m2		ITP sign off		H	H	30/08/23	FURTHER EXCAVATION 29/8/23	gpc	
12.	Backfilling & make good	After treatment	Excavations backfilled to surrounding levels Soils placed in 300mm layers and compacted to 95% under Level 1 supervision Treatment area levelled to original levels Any excess material married into the general treatment area		Compaction certificates ITP sign off		H	H	02/09/23		gpc	Report Rec'd 11.9.23.
13.	Site survey	Completion of backfilling	Work areas surveyed to verify final levels		Survey result ITP sign off		H	H	04/09/23		gpc	
14.	Demobilisation	At completion	All plant and equipment removed and site left tidy		ITP sign off		V	W	04/09/23		Q.X	
15.	Dilapidation photos	After works	Document final condition of the retail building by taking photos		Photos ITP sign off		H, D	W	04/09/23		Q.X	TO BE PROVIDED

Records of Inspection or Test Legend: List Inspection and Test Report Type. * For activities with multiple frequencies write date of initial inspection. Those Items requiring multiple inspections should be documented on a separate ITR.

Inspection/Test Responsibility Legend: X = Worker or workgroup self-inspection; H = Hold Point; D = Document; R = Review; V = Visual; W = Witness; C = Consultant responsibility to EPS

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7. APPENDIX B – MATERIAL EXPORT

INSPECTION AND TEST REPORT 01
ONSITE SOIL MOVEMENT – EXCAVATED SOILS

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715	**Date**	
Project Manager	Jack Vahtera	**Prepared by**	

Source	Truck Loads	Volume (m^3)	Destination	Material Type	Other / Comments
FTG SP1	20	300 m^3	FTG AREA AROUND CONCRETE BUND STOCKPILE TREATMENT AREA	FILL + ROCK	ROCKS (LARGE)
FTG SP2	34	600 m^3	FTG AREA AROUND CONCRETE BUND (CLOSER TO SP AREA)	FILL + ROCK	
FOT AREA 2 SP1	22	293 m^3	REFILL STOCKPILE TREATMENT AREA	FILL	~~HALF~~ LOADS 20T
FOT AREA 1 SP 2	25	300 m^3	REFILL STOCKPILE TREATMENT AREA	FILL	
FOT AREA 1 SP3	25	350 m^3	REFILL STOCKPILE TREATMENT AREA	FILL	
FOT AREA 1 SP 4	26	350 m^3	REFILL STOCKPILE TREATMENT AREA	FILL	
FOT AREA 1 SP5	22	293 m^3	REFILL STOCKPILE TREATMENT AREA	FILL	

INSPECTION AND TEST REPORT 01
ONSITE SOIL MOVEMENT – EXCAVATED SOILS

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715	**Date**	
Project Manager	Jack Vahtera	**Prepared by**	

Source	Truck Loads	Volume (m^3)	Destination	Material Type	Other / Comments
FOT AREA 4 SP 1	10	150 m^3	BACK FILL FOT AREA 4 STOCKPILE AREA	FILL	
FOT AREA 3 SP 1	18	300 m^3	BACK FILL FOT A3 STOCKPILE AREA	FILL	25T LOADS
FOT AREA 3 SP2	18	300 m^3	BACKFILL FOT A3 STOCKPILE AREA	FILL	25T LOADS
FOT AREA3 SP3	15	250 m^3	BACKFILL FOT A3 STOCKPILE AREA	FILL	
FOT AREA3 SP4	22	366 m^3	BACKFILL FOT A3 STOCKPILE AREA	FILL	
FOT AREA 3 SP5	25	416 m^3	BACKFILL FOT A3 STOCKPILE AREA	FILL	
FOT AREA3 SP6	24	400 m^3	BACKFILL FOT A3 STOCKPILE AREA	FILL	

INSPECTION AND TEST REPORT 03
ONSITE SOIL MOVEMENT – TREATED SOILS

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715	**Date**	
Project Manager	Jack Vahtera	**Prepared by**	

Source	Truck Loads	Volume (m^3)	Destination	Material Type	Other / Comments
FOT AREA 1 SP5		18 1 T = 271.5 M^3	STOCKPILE AREA		25/10/22
FOT AREA 1 SP4		350 M^3	STOCKPILE AREA		26/10/22
FOT AREA 1 SP3		497.57T = 331.71 M^3	STOCKPILE AREA		27/10/22 31/10/22
FOT AREA 1 SP2		456T = 304 M^3	STOCKPILE AREA		28/10/22
FOT AREA 2 SP1		662 T = 441 M^3	STOCKPILE AREA		2/11/22
FTG SP1		294 T = 196 M^3	STOCKPILE AREA		2/11/22
FTG SP2		1080T = 720 M^3	STOCKPILE AREA		3/11/22

INSPECTION AND TEST REPORT 03
ONSITE SOIL MOVEMENT – TREATED SOILS

ENVIROPACIFIC

Project Name	CS Energy Callide PFAS	**Project No**	107223
Location	959 Biloela Callide Rd, Mount Murchison 4715	**Date**	
Project Manager	Jack Vahtera	**Prepared by**	

Source	Truck Loads	Volume (m^3)	Destination	Material Type	Other / Comments
FOT A4 SP1		169T = 112.67M^3	STOCKPILE AREA	ROCK	
FOT A3 SP6		363T	STOCKPILE AREA	ROCK FILL	7/11/22
FOT A3 SP6		387T	STOCKPILE AREA.	FILL	8/11/22
FOT A3 SP5		505T	STOCKPILE AREA	FILL	9/11/22
FOT A3 SP4, SP3, SP2, SP1		1005T	STOCKPILE AREA	FILL	10/11/22

4 August 2023

Adrian Scott
Enviropacific
2/21 Kyabra St
Newstead Qld 4006

RE: ACCEPTANCE OF WASTE – PFAS Regulated waste

Dear Adrian,

Thank you for contacting us in relation to disposal of PFAS contaminated concrete from Callide Power Station, as described in the report titled "Concrete Bund Waste Characterisation" prepared by Epic Environmental, referenced as BCL230091.01 and dated 1 August 2023.

We can accept this waste for lined disposal at Stapylton Resource Recovery.

We provide this approval as per the acceptance of the facility's EA Permit (P-EA-100287544) on Lots 2 and 3 on SP279441. Located at Stapylton Resource Recovery, 144 Rossmanns Road, Stapylton, QLD.

Please note relevant waste tracking documentation is required to dispose of regulated waste. This material must be tracked as M270.

If you require any further information, please contact me on 0432 182 023.

Regards,



Peta Rutherford
Environmental Manager
BMI Group

Epic Environmental Pty Ltd
ABN: 54 169 57 92 75
Level 17, 95 North Quay
Brisbane QLD 4000
1800 779 363
www.epicenvironmental.com.au

1 August 2023 Ref: BCL230091.01

Holly Evelyn
Operations Project Lead - PFAS
CS Energy Limited
PO Box 392
Biloela QLD 4715
HEVELYN@csenergy.com.au

Dear Holly

Subject: Callide Power Station FTG Remediation - Concrete Bund Waste Characterisation

Epic Environmental Pty Ltd (Epic) was engaged by CS Energy Limited to prepare this waste classification assessment of the fire training ground (FTG) concrete bund structure at Callide Power Station (CPS), located approximately 9 km north-east of Biloela, Queensland.

1 BACKGROUND

Initial investigations completed at the site in 2019 and 2020 identified historical releases of aqueous film forming foams (AFFF) occurred at the fire training ground (FTG), with concentrations of per- and poly-fluoroalkyl substances (PFAS) detected in soil above the adopted assessment criteria. Detailed investigation of FTG was completed in 2021 to delineate the vertical and lateral extent of PFAS soil contamination and inform remediation and/or management of impacts.

Remediation works were completed at the FTG in late 2022 and included the excavation of PFAS impacted soils surrounding the FTG concrete bund, chemical stabilisation of soils with powdered activated carbon and reinstatement of material.

In order to manage residual PFAS impacts associated with the concrete bund structure, further remediation is proposed to be completed including the removal and offsite disposal of the concrete bund structure and remediation of underlying soils.

Previous testing of the concrete bund structure was completed by Epic in October 2021 and included the collection and analysis of three concrete core samples. To support proposed offsite disposal of material, an additional four concrete core samples were collected by CS Energy for laboratory analysis in July 2023.

2 OBJECTIVE

The objective of the waste classification assessment is to provide CS Energy with summary of representative waste characterisation of the FTG concrete bund structure, to facilitate offsite disposal at a licensed landfill facility.

3 SCOPE OF WORK

To achieve the objectives, Epic completed the following scope of work:

- Review of supplied laboratory documentation
- Assessment of analytical results against relevant waste classification criteria defined under the Environmental Protection Act 1994, Environmental Protection Regulation 2019 and the Department of Environment and Science's (DES's) Model operating conditions, ERA 60—Waste disposal

4 SAMPLING METHODOLGY

Core samples were collected from seven representative locations within the FTG bund area. Cores were recovered using a 50 mm or 150 mm core barrel, and comprised the full depth of the concrete slab.

Samples were placed into large zip-lock bags (double bagged) using nitrile gloves, prior to being sent to the analytical laboratory.

5 LABORATORY ANALYSIS

Samples were submitted to ALS for a combination of the following analysis following crushing of the full core sample:

- PFAS (suite of 28)
- Leachable (DI or TCLP) PFAS
- PFAS Total Oxidizable Precursor (TOP) Assay
- Total Organic Fluorine (TOF)

6 ANALYTICAL RESULTS

Analytical results are presented in **Table T1** and **Table T2** (**Appendix A**), with laboratory certificates included in **Appendix B**.

6.1 PFAS

- PFOS – All samples reported concentrations of PFOS above the laboratory's limit of reporting (LOR), with samples Concrete Core 10, CC01, CC02, CC03 and CC04 reported above the ecological indirect exposure criteria of 0.01 mg/kg. The highest concentration was reported in sample CC02 (0.324 mg/kg). All samples were reported below the ERA60 waste disposal maximum limit
- Sum of PFOS & PFHxS – All samples reported concentrations of the sum of PFOS & PFHxS above the laboratory's LOR, with samples Concrete Core 10, CC01, CC02, CC03 and CC04 reported above the HIL-A (residential) criteria of 0.01 mg/kg. The highest concentration was reported in sample CC02 (0.545 mg/kg)
- PFOA – All samples reported concentrations of PFOA above the laboratory's LOR, with all samples below the adopted assessment criteria. The highest concentration was reported in sample CC02 (0.0456 mg/kg)
- Total PFAS – All samples reported concentrations of total PFAS above the laboratory's LOR and the Regulated Waste Category 1 limit, with all samples below the ERA60 waste disposal maximum limit. The highest concentration was reported in sample CC02 (1.29 mg/kg)
- All samples reported detections of PFBS, PFPeS, PFHxS, PFOS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, 6:2FTS and 8:2FTS
- Detections of PFHpS, PFDS, PFNA, PFDA, FOSA, 4:2 FTS and 10:2FTS were reported in some samples
- No detections of PFUnDA, PFDoDA, PFTDA, PFTeDA, MeFOSA, EtFOSA, MeFOSE, EtFOSE, MEFOSAA and EtFOSAA were reported.

6.2 Total Oxidisable Precursor Assay (TOPA)

Total Oxidisable Precursor Assay (TOPA) analysis was completed on samples Concrete Core 10 and Concrete Core 12. Comparison of TOPA and standard analytical results reported percentage decreases of total PFAS between -10% (Concrete Core 10) and -59% (Concrete Core 12). On this basis, it is considered that concrete material at the FTG is unlikely to contain an additional mass of PFAS precursors.

Review of TOPA analytical results in accordance with Section 19.2 of the PFAS NEMP, indicates full oxidisation of samples as part of TOPA analysis, with perfluoroalkyl acids precursors (i.e. 6:2 FTS and FOSA) reported to be below the NEMP QA Criteria of 5% post oxidisation. On this basis, it is considered that oxidation of samples has been effective and TOPA results are representative.

6.3 Total Organic Fluorine (TOF)

Analysis for TOF was completed on samples Concrete Core 10 and Concrete Core 12, with sample Concrete Core 10 (0.57 mg/kg) reporting concentrations above the laboratory's LOR of 0.1 mg/kg. Comparison of TOF with standard and TOPA analytical results indicates that other fluorinated organic compounds are unlikely to be present in the samples (Total PFAS greater than TOF).

6.4 Leachability

- PFOS – Concentrations were reported to be leachable in all concrete samples, with all samples leachable above the 99% Species Protection limit of 0.00023 µg/L and 4 of the 7 samples leachable above the 95% Species Protection limit of 0.13 µg/L. The highest concentration was reported in sample CC04 (5.16 µg/L)
- Sum of PFOS & PFHxS – Concentrations were reported to be leachable from all concrete samples, with 6 of the 7 samples leachable above the drinking water criteria of 0.07 µg/L with 5 of these samples also leachable above the recreational water criteria of 2.0 µg/L. The highest concentration was reported in sample CC04 (8.45 µg/L)
- PFOA – Concentrations were reported to be leachable from all concrete samples, with 4 of the 7 samples leachable above the drinking water criteria of 0.56 µg/L. The highest concentration was reported in sample CC04 (1.09 µg/L)
- Concentrations of total PFAS were reported above the laboratory's LOR in all concrete samples, with all samples below the ERA60 waste disposal maximum limit. The highest concentration was reported in sample CC02 (22.7 µg/L)

7 WASTE CLASSIFICATION

In accordance with Sections 42 & 43 and Schedule 9, Parts 1 & 2 of the Environmental Protection Regulation 2019, concrete material forming the bunded structure at the FTG is classified as Category 1 Regulated Waste. Review of PFAS concentrations against Model operating conditions ERA 60—Waste disposal, indicates material is suitable for landfill disposal to a double lined landfill cell (or equivalent).

Regards



Luke Amies
Principal Environmental Scientist

0447 661 021
lamies@epicenvironmental.com.au

Enclosures: Appendix A – Tables, Appendix B - Laboratory Reports

APPENDIX A TABLES

Table T1. Concrete Analytical Results – PFAS

Table T2. Concrete Leachate Results – PFAS

Epic File: BCL230091.01
Site: Callide Power Station
Client: CS Energy
Report Date: Aug-23

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T1: Concrete Analytical Results - PFAS

Sample Date	Laboratory Sample Number	Sample Number	Location	Material Type	Analysis	Total Organic Fluorine (TOF) (mg/kg)	Perfluoroalkyl Sulfonic Acids (PSA) (mg/kg)							Perfluoroalkyl Carboxylic Acids (PCA) (mg/kg)										Perfluoroalkyl Sulfonamides (mg/kg)							Fluorotelomer Sulfonic Acids (FSA) (mg/kg)				Total PFAS (mg/kg)		
							PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS	Sum of TOP C_4 - C_{14} Carboxylates and C_4 - C_8 Sulfonates	Sum of TOP C_4 as Fluorine
PFAS NEMP Human Health - Residential with garden/accessible soil (HIL-A)						-	-	-	-	-	-	-	**0.01**	-	-	-	-	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Human Health - Industrial/Commercial (HIL-D)						-	-	-	-	-	-	-	**20**	-	-	-	-	**50**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Interim Soil - Ecological Indirect Exposure						-	-	-	-	-	**0.01**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Interim Soil - Ecological Direct Exposure						-	-	-	-	-	**1.0**	-	-	-	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ERA 60 Waste Disposal - Maximum Total Contaminant Level - Cover Material						-	-	-	-	-	**6.00**	-	-	-	-	-	-	**16.00**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**10.00**	-	-
QLD Regulated Waste - Category 1						-	-	-	-	-	-	-	-	-	-	-	-	**16.00**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.00**	-	-
Laboratory Level of Reporting (mg/kg) - Standard Analysis						1	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0012	0.0005	0.0012	0.0012	0.0012	0.0012	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	-	-
Laboratory Level of Reporting (mg/kg) - TOPA						-	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002
Fire Training Ground (FTG)																																						
12-Oct-21	EB2129941088	Concrete Core 10	Fire Training Ground	Concrete	Standard	-	**0.0255**	**0.018**	**0.104**	**0.0085**	**0.244**	**0.0012**	**0.348**	**0.015**	**0.0233**	**0.0968**	**0.0177**	**0.0324**	**0.0008**	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0012	**0.0012**	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	<0.0005	**0.0864**	**0.0215**	**0.0039**	**0.701**		
14-Oct-21	EB2131497063	Concrete Core 10	Fire Training Ground	Concrete	TOPA	**0.57**	**0.0184**	**0.0136**	**0.0674**	**0.0065**	**0.155**	<0.0010	**0.222**	**0.06**	**0.0819**	**0.1680**	**0.0255**	**0.0297**	**0.0044**	**0.0029**	**0.0014**	**0.0014**	<0.0005	<0.0013	<0.0005	<0.0013	<0.0013	<0.0013	<0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.6320**	**0.6320**	**0.409**
12-Oct-21	EB2129941089	Concrete Core 11	Fire Training Ground	Concrete	Standard	-	**0.0287**	**0.0106**	**0.0234**	**0.0004**	**0.0033**	<0.0002	**0.0267**	**0.01**	**0.0181**	**0.0793**	**0.0129**	**0.0107**	**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	**0.1090**	**0.0110**	<0.0005	**0.318**	-	-
12-Oct-21	EB2129941090	Concrete Core 12	Fire Training Ground	Concrete	Standard	-	**0.0008**	**0.0004**	**0.0008**	<0.0002	**0.0008**	<0.0002	**0.0016**	**0.001**	**0.0024**	**0.0151**	**0.0029**	**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	**0.0051**	**0.0013**	<0.0005	**0.0311**	-	-
14-Oct-21	EB2131497064	Concrete Core 12	Fire Training Ground	Concrete	TOPA	<0.10	**0.0003**	**0.0002**	**0.0004**	<0.0002	**0.0004**	<0.0002	**0.0008**	**0.00**	**0.0018**	**0.0070**	**0.0012**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	**0.0126**	**0.0126**	**0.0083**
03-Jul-23	EB2320334001	CC01	Fire Training Ground	Concrete	Standard	-	**0.0233**	**0.0164**	**0.0263**	**0.0006**	**0.015**	<0.0002	**0.0413**	**0.015**	**0.0354**	**0.187**	**0.0391**	**0.0121**	**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	**0.0042**	**0.133**	**0.0083**	<0.0005	**0.516**	-	-
03-Jul-23	EB2320334002	CC02	Fire Training Ground	Concrete	Standard	-	**0.0558**	**0.0379**	**0.221**	**0.0114**	**0.324**	<0.0005	**0.545**	**0.019**	**0.0425**	**0.308**	**0.051**	**0.0406**	**0.0015**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0012	**0.0008**	<0.0012	<0.0012	<0.0012	<0.0012	<0.0005	<0.0005	**0.0006**	**0.133**	**0.016**	**0.0045**	**1.29**	-	-
03-Jul-23	EB2320334003	CC03	Fire Training Ground	Concrete	Standard	-	**0.0233**	**0.0195**	**0.0532**	**0.0012**	**0.0199**	<0.0002	**0.0731**	**0.015**	**0.0296**	**0.146**	**0.0284**	**0.0231**	**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	**0.001**	**0.159**	**0.0108**	**0.0007**	**0.532**	-	-
03-Jul-23	EB2320334004	CC04	Fire Training Ground	Concrete	Standard	-	**0.0157**	**0.0159**	**0.0838**	**0.0094**	**0.209**	<0.0002	**0.293**	**0.008**	**0.0114**	**0.0662**	**0.0161**	**0.0279**	**0.0011**	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0006	**0.0006**	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	**0.128**	**0.0135**	**0.0016**	**0.609**	-	-

NOTES:

1	Analyte exceeds the PFAS NEMP HIL-A
1	Analyte exceeds the PFAS NEMP HIL-D
1	Analyte exceeds the PFAS NEMP Ecological Indirect Exposure
1	Analyte exceeds the PFAS NEMP Ecological Direct Exposure
1	Analyte exceeds the ERA60 Double Lined Landfill Criteria
1	Analyte exceeds the QLD Regulated Waste Category 1 Limit
-	Not analysed

Epic File: BCL230091.01
Site: Callide Power Station - Source Delineation
Client: CS Energy
Report Date: 01-Aug-23

Epic Environmental Pty Ltd
Level 17, 95 North Quay, Brisbane QLD 4000

Table T2: Concrete Leachate Results - PFAS

\	Laboratory Sample Number	Sample Number	Material Type	Analysis	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)							Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)											Perfluoroalkyl Sulfonamides (µg/L)							Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)
					PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)					-	-	-	-	0.00023	-	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)					-	-	-	-	0.13	-	-	-	-	-	-	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water					-	-	0.07	-	0.07	-	0.07	-	-	-	-	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water					-	-	0.7	-	0.7	-	0.7	-	-	-	-	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ERA 60 Waste Disposal - Allowable Leaching Level - Double Lined Landfill					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**50.00**
Laboratory Level of Reporting (µg/L)) - Standard Analysis					0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005
Laboratory Level of Reporting (µg/L)) - TOPA					0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002
Fire Training Ground (FTG)																																		
12-Oct-21	EB2129941088	Concrete Core 10	Concrete	Leachate (ASLP)	**0.8730**	**0.712**	**2.87**	**0.218**	**4.5**	<0.0299	**7.37**	**0.64**	**0.879**	**3.53**	**0.598**	**0.858**	<0.0299	<0.0299	<0.0299	<0.0299	<0.0299	<0.0748	**0.0299**	<0.075	<0.075	<0.075	<0.075	<0.0299	<0.0299	<0.030	**2.75**	**0.299**	<0.030	**18.8**
12-Oct-21	EB2129941089	Concrete Core 11	Concrete	Leachate (ASLP)	**1.9800**	**0.777**	**1.11**	**0.0168**	**0.113**	<0.0153	**1.22**	**1.01**	**1.44**	**7.14**	**0.878**	**0.475**	**0.0214**	<0.0153	<0.0153	<0.0153	<0.0153	<0.0382	<0.0153	<0.038	<0.038	<0.038	<0.038	<0.0153	<0.0153	**0.0380**	**5.29**	**0.504**	<0.015	**20.8**
12-Oct-21	EB2129941090	Concrete Core 12	Concrete	Leachate (ASLP)	**0.0937**	**0.0167**	**0.0264**	**0.0014**	**0.0245**	<0.0005	**0.0509**	**0.07**	**0.0988**	**0.613**	**0.0985**	**0.0132**	**0.0015**	**0.0006**	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	**0.0020**	**0.171**	**0.031**	<0.001	**1.26**
03-Jul-23	EB2320334001	CC01	Concrete	Leachate (TCLP)	**0.693**	**0.324**	**0.524**	**0.0079**	**0.0858**	<0.0079	**0.61**	**0.597**	**1.24**	**5.2**	**1.13**	**0.302**	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0197	<0.0079	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	**0.12**	**4.5**	**0.069**	<0.008	**14.8**
03-Jul-23	EB2320334002	CC02	Concrete	Leachate (TCLP)	**1.5**	**0.966**	**3.77**	**0.226**	**4.2**	<0.0080	**7.97**	**0.666**	**1.16**	**5**	**0.806**	**0.966**	**0.0296**	<0.0080	<0.0080	<0.0080	<0.0080	<0.0200	**0.0136**	<0.020	<0.020	<0.020	<0.020	<0.0080	<0.0080	**0.014**	**3.2**	**0.167**	<0.008	**22.7**
03-Jul-23	EB2320334003	CC03	Concrete	Leachate (TCLP)	**1.2**	**0.69**	**1.75**	**0.0349**	**0.314**	<0.0079	**2.06**	**0.937**	**1.71**	**6.86**	**1.12**	**0.667**	**0.0143**	<0.0079	<0.0079	<0.0079	<0.0079	<0.0198	<0.0079	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	**0.052**	**5.29**	**0.085**	<0.008	**20.7**
03-Jul-23	EB2320334004	CC04	Concrete	Leachate (TCLP)	**0.578**	**0.528**	**3.29**	**0.326**	**5.16**	<0.0079	**8.45**	**0.3**	**0.449**	**2.54**	**0.783**	**1.09**	**0.0443**	**0.0111**	<0.0079	<0.0079	<0.0079	<0.0198	**0.0158**	<0.020	<0.020	<0.020	<0.020	<0.0079	<0.0079	**0.017**	**6.78**	**0.29**	<0.008	**22.2**

NOTES:
1 Analyte exceeds the PFAS NEMP Freshwater 99% Species Protection Limit
1 Analyte exceeds the PFAS NEMP Freshwater 95% Species Protection Limit
1 Analyte exceeds the PFAS NEMP Health Based - Drinking Water Criteria
1 Analyte exceeds the PFAS NEMP Health Based - Recreational Water Criteria
1 Analyte exceeds the ERA60 Double Lined Landfill Criteria

APPENDIX B LABORATORY REPORTS

Enviropacific Services P/L (QLD)
1392 Kingsford Smith Drive
Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Jack Vahtera**

Report **928722-L-V4**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Oct 05, 2022

Client Sample ID			**FTG_SP1_1**	**FTG_SP1_2**	**FTG_SP2_1**	**FTG_SP2_2**
Sample Matrix			**AUS Leachate**	**AUS Leachate**	**AUS Leachate**	**AUS Leachate**
Eurofins Sample No.			**B22-Oc0005289**	**B22-Oc0005290**	**B22-Oc0005291**	**B22-Oc0005292**
Date Sampled			**Sep 26, 2022**	**Sep 26, 2022**	**Oct 04, 2022**	**Oct 04, 2022**
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	8.2	8.7	9.0	9.1
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.02	0.02	0.01	0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	0.02	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	0.02	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	0.02	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	77	75	81	76
13C5-PFPeA (surr.)	1	%	94	87	96	97
13C5-PFHxA (surr.)	1	%	93	93	97	95
13C4-PFHpA (surr.)	1	%	119	105	118	117
13C8-PFOA (surr.)	1	%	109	96	110	113
13C5-PFNA (surr.)	1	%	139	128	144	141
13C6-PFDA (surr.)	1	%	135	118	143	146
13C2-PFUnDA (surr.)	1	%	72	66	81	81
13C2-PFDoDA (surr.)	1	%	80	72	97	96
13C2-PFTeDA (surr.)	1	%	57	52	67	65
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			FTG_SP1_1	FTG_SP1_2	FTG_SP2_1	FTG_SP2_2
Sample Matrix			AUS Leachate	AUS Leachate	AUS Leachate	AUS Leachate
Eurofins Sample No.			B22-Oc0005289	B22-Oc0005290	B22-Oc0005291	B22-Oc0005292
Date Sampled			Sep 26, 2022	Sep 26, 2022	Oct 04, 2022	Oct 04, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	121	108	111	119
D3-N-MeFOSA (surr.)	1	%	174	157	175	179
D5-N-EtFOSA (surr.)	1	%	163	153	180	186
D7-N-MeFOSE (surr.)	1	%	98	105	109	121
D9-N-EtFOSE (surr.)	1	%	136	126	142	149
D5-N-EtFOSAA (surr.)	1	%	91	89	101	104
D3-N-MeFOSAA (surr.)	1	%	108	101	116	117
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	[N09]0.02	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.10	[N09]0.41	[N09]0.04	[N09]0.03
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	[N09]0.02	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	93	96	99	98
18O2-PFHxS (surr.)	1	%	130	124	138	126
13C8-PFOS (surr.)	1	%	115	86	124	126
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	0.08	0.16	0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	97	90	95	98
13C2-6:2 FTSA (surr.)	1	%	84	71	73	71
13C2-8:2 FTSA (surr.)	1	%	94	116	146	109
13C2-10:2 FTSA (surr.)	1	%	151	145	175	187
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.1	0.41	0.04	0.03
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.1	0.43	0.04	0.03
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.1	0.43	0.04	0.03
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.2	0.64	0.06	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	0.2	0.71	< 0.1	< 0.1

Client Sample ID			FOTA2_SP1_1	FOTA2_SP1_2	FOT AREA 1 SP2	FOT AREA 1 SP2 DUP
Sample Matrix			AUS Leachate	AUS Leachate	AUS Leachate	AUS Leachate
Eurofins Sample No.			B22-Oc0005293	B22-Oc0005294	B22-Oc0005295	B22-Oc0005296
Date Sampled			Oct 04, 2022	Oct 04, 2022	Oct 04, 2022	Oct 04, 2022
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.1	9.1	9.2	9.1
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.04	0.06	0.07	0.03
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.10	0.20	0.36	0.11
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.03	[N09]0.04	[N09]0.06	[N09]0.02
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.30	[N09]0.17	[N09]0.35	[N09]0.30
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	[N09]0.01	[N09]0.01	[N09]0.02
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	77	77	81	79
13C5-PFPeA (surr.)	1	%	89	87	85	95
13C5-PFHxA (surr.)	1	%	80	78	68	84
13C4-PFHpA (surr.)	1	%	101	104	103	111
13C8-PFOA (surr.)	1	%	67	73	62	67
13C5-PFNA (surr.)	1	%	118	128	124	120
13C6-PFDA (surr.)	1	%	39	52	36	33
13C2-PFUnDA (surr.)	1	%	58	65	55	51
13C2-PFDoDA (surr.)	1	%	82	87	87	84
13C2-PFTeDA (surr.)	1	%	60	57	54	59
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	[N09]0.18	[N09]0.26
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	114	109	110	106
D3-N-MeFOSA (surr.)	1	%	INT	INT	INT	197
D5-N-EtFOSA (surr.)	1	%	194	196	176	183
D7-N-MeFOSE (surr.)	1	%	131	122	114	118
D9-N-EtFOSE (surr.)	1	%	160	156	148	142
D5-N-EtFOSAA (surr.)	1	%	90	100	[N09]94	[N09]95
D3-N-MeFOSAA (surr.)	1	%	109	112	110	106

Client Sample ID			FOTA2_SP1_1	FOTA2_SP1_2	FOT AREA 1 SP2	FOT AREA 1 SP2 DUP
Sample Matrix			AUS Leachate	AUS Leachate	AUS Leachate	AUS Leachate
Eurofins Sample No.			B22-Oc0005293	B22-Oc0005294	B22-Oc0005295	B22-Oc0005296
Date Sampled			Oct 04, 2022	Oct 04, 2022	Oct 04, 2022	Oct 04, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.01	0.07	0.16	0.02
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	[N09]0.06	[N09]0.09	[N09]0.44	[N09]0.55
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	0.06	0.11	0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.03	[N09]0.10	[N09]0.24	[N09]0.03
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]3.3	[N09]2.5	[N09]5.4	[N09]3.0
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.52	[N09]0.24	[N09]0.69	[N09]0.65
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]25	[N09]23	[N09]66	[N09]70
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	[N09]< 0.01	[N09]< 0.01	[N09]0.13	[N09]0.19
13C3-PFBS (surr.)	1	%	88	88	81	88
18O2-PFHxS (surr.)	1	%	88	103	91	94
13C8-PFOS (surr.)	1	%	90	86	69	63
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	0.12	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	93	92	92	94
13C2-6:2 FTSA (surr.)	1	%	67	73	77	88
13C2-8:2 FTSA (surr.)	1	%	90	104	96	120
13C2-10:2 FTSA (surr.)	1	%	150	155	118	111
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	28.3	25.5	71.4	73
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	25.3	23.17	66.35	70.3
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	28.6	25.67	71.75	73.3
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	28.78	26.16	72.4	73.48
Sum of PFASs (n=30)*	0.1	ug/L	29.39	26.66	74.2	75.19

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Oct 05, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Oct 05, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Oct 05, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Oct 05, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Oct 05, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 928722
Phone: (07) 3637 2900
Fax:

Received: Oct 5, 2022 9:30 AM
Due: Oct 10, 2022
Priority: 3 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FTG_SP1_1	Sep 26, 2022		AUS Leachate	B22-Oc0005289	X	X
2	FTG_SP1_2	Sep 26, 2022		AUS Leachate	B22-Oc0005290	X	X
3	FTG_SP2_1	Oct 04, 2022		AUS Leachate	B22-Oc0005291	X	X
4	FTG_SP2_2	Oct 04, 2022		AUS Leachate	B22-Oc0005292	X	X
5	FOTA2_SP1_1	Oct 04, 2022		AUS Leachate	B22-Oc0005293	X	X
6	FOTA2_SP1_2	Oct 04, 2022		AUS Leachate	B22-Oc0005294	X	X
7	FOT AREA 1 SP2	Oct 04, 2022		AUS Leachate	B22-Oc0005295	X	X
8	FOT AREA 1 SP2 DUP	Oct 04, 2022		AUS Leachate	B22-Oc0005296	X	X
9	TRIP BLANK	Sep 20, 2022		Water	B22-Oc0005297		X
Test Counts						8	9

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S22-Se0065737	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S22-Se0065737	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-Se0065737	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-Se0065737	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-Se0065737	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-Se0065737	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-Se0065737	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-Se0065737	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Se0065737	NCP	ug/L	0.04	0.04	1.5	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Se0065737	NCP	ug/L	0.13	0.14	8.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-Se0065737	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-Se0065737	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Report has been revised to V2 to amend FOG sample names to FOT.

Report has been revised to V3 to amend FOT AREA 2 SP2 samples to FOT AREA 1 SP2

Report has been revised to V4 to amend sample names.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

James McCann	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Jack Vahtera**

Report **928722-W-V2**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Oct 05, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-Oc0005297**
Date Sampled			**Sep 20, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	108
13C5-PFPeA (surr.)	1	%	126
13C5-PFHxA (surr.)	1	%	106
13C4-PFHpA (surr.)	1	%	118
13C8-PFOA (surr.)	1	%	98
13C5-PFNA (surr.)	1	%	97
13C6-PFDA (surr.)	1	%	90
13C2-PFUnDA (surr.)	1	%	80
13C2-PFDoDA (surr.)	1	%	70
13C2-PFTeDA (surr.)	1	%	97
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	58
D3-N-MeFOSA (surr.)	1	%	47

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-Oc0005297
Date Sampled			Sep 20, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	52
D7-N-MeFOSE (surr.)	1	%	45
D9-N-EtFOSE (surr.)	1	%	48
D5-N-EtFOSAA (surr.)	1	%	60
D3-N-MeFOSAA (surr.)	1	%	57
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	135
18O2-PFHxS (surr.)	1	%	121
13C8-PFOS (surr.)	1	%	114
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	138
13C2-6:2 FTSA (surr.)	1	%	113
13C2-8:2 FTSA (surr.)	1	%	102
13C2-10:2 FTSA (surr.)	1	%	76
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Oct 05, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Oct 05, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Oct 05, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Oct 05, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Enviropacific Services P/L (QLD)
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QLD 4008

Order No.:
Report #: 928722
Phone: (07) 3637 2900
Fax:

Received: Oct 5, 2022 9:30 AM
Due: Oct 10, 2022
Priority: 3 Day
Contact Name: Jack Vahtera

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FTG SP 1	Sep 26, 2022		AUS Leachate	B22-Oc0005289	X	X
2	FTG SP 1 DUP	Sep 26, 2022		AUS Leachate	B22-Oc0005290	X	X
3	FTG SP 2	Oct 04, 2022		AUS Leachate	B22-Oc0005291	X	X
4	FTG SP 2 DUP	Oct 04, 2022		AUS Leachate	B22-Oc0005292	X	X
5	FOG AREA 2 SP1	Oct 04, 2022		AUS Leachate	B22-Oc0005293	X	X
6	FOG AREA 2 SP1 DUP	Oct 04, 2022		AUS Leachate	B22-Oc0005294	X	X
7	FOG AREA 2 SP2	Oct 04, 2022		AUS Leachate	B22-Oc0005295	X	X
8	FOG AREA 2 SP2 DUP	Oct 04, 2022		AUS Leachate	B22-Oc0005296	X	X
9	TRIP BLANK	Sep 20, 2022		Water	B22-Oc0005297		X

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Received: Oct 5, 2022 9:30 AM
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Priority: 3 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794	X	X
Test Counts	8	9

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	84			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	84			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	85			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	82			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	83			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	82			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	78			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	90			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	79			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	130			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	85			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	87			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	83			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	72			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	78			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	75			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	82			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	77			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	82			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	82			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	81			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	76			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	82			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	86			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	58			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	82			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	77			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	78			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	S22-Se0062232	NCP	%	84			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S22-Se0062232	NCP	%	93			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S22-Se0062232	NCP	%	87			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-Se0062232	NCP	%	90			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S22-Se0062232	NCP	%	89			50-150	Pass	
Perfluorononanoic acid (PFNA)	S22-Se0062232	NCP	%	89			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S22-Se0062232	NCP	%	94			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-Se0062232	NCP	%	99			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S22-Se0062232	NCP	%	103			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-Se0062232	NCP	%	145			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-Se0062232	NCP	%	106			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	S22-Se0062232	NCP	%	91			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-Se0062232	NCP	%	112			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-Se0062232	NCP	%	97			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-Se0062232	NCP	%	97			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-Se0062232	NCP	%	104			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-Se0062232	NCP	%	98			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-Se0062232	NCP	%	87			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S22-Se0062232	NCP	%	87			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-Se0062232	NCP	%	72			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-Se0062232	NCP	%	69			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-Se0062232	NCP	%	83			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Se0062232	NCP	%	82			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-Se0062232	NCP	%	88			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Se0062232	NCP	%	104			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-Se0062232	NCP	%	57			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-Se0062232	NCP	%	86			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-Se0062232	NCP	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-Se0062232	NCP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-Se0062232	NCP	%	96			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-Oc0005297	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-Oc0005297	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Oc0005297	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Oc0005297	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Oc0005297	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Oc0005297	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Oc0005297	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Oc0005297	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Oc0005297	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Oc0005297	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Report has been revised to V2 to amend FOG sample names to FOT.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

James McCann	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Jack Vahtera**

Report **931622-L-V2**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Oct 14, 2022

Client Sample ID			**FOT AREA 1 SP3**	**FOTA2_SP1_3**	**FOT AREA 1 SP4**	**FOT AREA 1 SP5**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-Oc0026114**	**B22-Oc0026115**	**B22-Oc0026116**	**B22-Oc0026117**
Date Sampled			**Oct 05, 2022**	**Oct 05, 2022**	**Oct 06, 2022**	**Oct 08, 2022**
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.1	9.1	9.0	9.3
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.02	0.03	0.01	0.06
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.09	0.22	0.02	1.1
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.02	[N09]0.05	< 0.01	[N09]0.21
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.16	[N09]0.32	[N09]0.02	[N09]0.77
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	0.02	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	107	104	101	104
13C5-PFPeA (surr.)	1	%	98	90	87	80
13C5-PFHxA (surr.)	1	%	119	101	119	74
13C4-PFHpA (surr.)	1	%	86	104	99	81
13C8-PFOA (surr.)	1	%	123	94	106	69
13C5-PFNA (surr.)	1	%	91	107	93	96
13C6-PFDA (surr.)	1	%	71	78	92	65
13C2-PFUnDA (surr.)	1	%	77	101	72	96
13C2-PFDoDA (surr.)	1	%	52	79	46	66
13C2-PFTeDA (surr.)	1	%	39	51	29	45
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			FOT AREA 1 SP3	FOTA2_SP1_3	FOT AREA 1 SP4	FOT AREA 1 SP5
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-Oc0026114	B22-Oc0026115	B22-Oc0026116	B22-Oc0026117
Date Sampled			Oct 05, 2022	Oct 05, 2022	Oct 06, 2022	Oct 08, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	81	87	81	93
D3-N-MeFOSA (surr.)	1	%	81	96	80	104
D5-N-EtFOSA (surr.)	1	%	70	97	61	91
D7-N-MeFOSE (surr.)	1	%	49	63	41	57
D9-N-EtFOSE (surr.)	1	%	53	72	39	59
D5-N-EtFOSAA (surr.)	1	%	50	71	47	68
D3-N-MeFOSAA (surr.)	1	%	58	87	60	80
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.01	0.02	< 0.01	0.12
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	[N09]0.15	[N09]0.07	[N09]0.08	[N09]< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.01	0.01	0.02	0.08
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.03	[N09]0.08	[N09]0.01	[N09]0.42
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]1.7	[N09]4.1	[N09]0.19	[N09]16
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.18	[N09]0.43	[N09]0.02	[N09]0.87
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]14	[N09]17	[N09]4.4	[N09]29
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	[N09]0.06	[N09]0.02	[N09]0.03	[N09]< 0.01
13C3-PFBS (surr.)	1	%	138	109	101	96
18O2-PFHxS (surr.)	1	%	114	106	133	98
13C8-PFOS (surr.)	1	%	65	74	77	72
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	0.04	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	87	111	90	92
13C2-6:2 FTSA (surr.)	1	%	123	123	105	118
13C2-8:2 FTSA (surr.)	1	%	89	106	84	85
13C2-10:2 FTSA (surr.)	1	%	42	65	37	54
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	15.7	21.1	4.59	45
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	14.16	17.32	4.42	29.77
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	15.86	21.42	4.61	45.77
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	16.04	21.74	4.64	47.26
Sum of PFASs (n=30)*	0.1	ug/L	16.49	22.35	4.8	48.63

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Oct 14, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Oct 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Oct 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Oct 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Oct 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 931622
Phone: (07) 3637 2900
Fax:

Received: Oct 14, 2022 9:20 AM
Due: Oct 19, 2022
Priority: 3 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT AREA 1 SP3	Oct 05, 2022		AUS Leachate - Reagent Water	B22-Oc0026114	X	X
2	FOT AREA 1 SP3 DUP	Oct 05, 2022		AUS Leachate - Reagent Water	B22-Oc0026115	X	X
3	FOT AREA 1 SP4	Oct 06, 2022		AUS Leachate - Reagent Water	B22-Oc0026116	X	X
4	FOT AREA 1 SP5	Oct 08, 2022		AUS Leachate - Reagent Water	B22-Oc0026117	X	X
Test Counts						4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Oc0026440	NCP	ug/L	0.05	0.05	3.4	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Report has been revised to V2 to amend sample ID from FOT A1 SP3 DUP to FOTA2_SP1_3

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

James McCann	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Jack Vahtera**

Report **931622-L-V2**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Oct 14, 2022

Client Sample ID			**FOT AREA 1 SP3**	**FOTA2_SP1_3**	**FOT AREA 1 SP4**	**FOT AREA 1 SP5**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-Oc0026114**	**B22-Oc0026115**	**B22-Oc0026116**	**B22-Oc0026117**
Date Sampled			**Oct 05, 2022**	**Oct 05, 2022**	**Oct 06, 2022**	**Oct 08, 2022**
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.1	9.1	9.0	9.3
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.02	0.03	0.01	0.06
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.09	0.22	0.02	1.1
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.02	[N09]0.05	< 0.01	[N09]0.21
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.16	[N09]0.32	[N09]0.02	[N09]0.77
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	0.02	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	107	104	101	104
13C5-PFPeA (surr.)	1	%	98	90	87	80
13C5-PFHxA (surr.)	1	%	119	101	119	74
13C4-PFHpA (surr.)	1	%	86	104	99	81
13C8-PFOA (surr.)	1	%	123	94	106	69
13C5-PFNA (surr.)	1	%	91	107	93	96
13C6-PFDA (surr.)	1	%	71	78	92	65
13C2-PFUnDA (surr.)	1	%	77	101	72	96
13C2-PFDoDA (surr.)	1	%	52	79	46	66
13C2-PFTeDA (surr.)	1	%	39	51	29	45
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			FOT AREA 1 SP3	FOTA2_SP1_3	FOT AREA 1 SP4	FOT AREA 1 SP5
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-Oc0026114	B22-Oc0026115	B22-Oc0026116	B22-Oc0026117
Date Sampled			Oct 05, 2022	Oct 05, 2022	Oct 06, 2022	Oct 08, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	81	87	81	93
D3-N-MeFOSA (surr.)	1	%	81	96	80	104
D5-N-EtFOSA (surr.)	1	%	70	97	61	91
D7-N-MeFOSE (surr.)	1	%	49	63	41	57
D9-N-EtFOSE (surr.)	1	%	53	72	39	59
D5-N-EtFOSAA (surr.)	1	%	50	71	47	68
D3-N-MeFOSAA (surr.)	1	%	58	87	60	80
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.01	0.02	< 0.01	0.12
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	[N09]0.15	[N09]0.07	[N09]0.08	[N09]< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.01	0.01	0.02	0.08
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.03	[N09]0.08	[N09]0.01	[N09]0.42
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]1.7	[N09]4.1	[N09]0.19	[N09]16
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.18	[N09]0.43	[N09]0.02	[N09]0.87
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]14	[N09]17	[N09]4.4	[N09]29
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	[N09]0.06	[N09]0.02	[N09]0.03	[N09]< 0.01
13C3-PFBS (surr.)	1	%	138	109	101	96
18O2-PFHxS (surr.)	1	%	114	106	133	98
13C8-PFOS (surr.)	1	%	65	74	77	72
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	0.04	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	87	111	90	92
13C2-6:2 FTSA (surr.)	1	%	123	123	105	118
13C2-8:2 FTSA (surr.)	1	%	89	106	84	85
13C2-10:2 FTSA (surr.)	1	%	42	65	37	54
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	15.7	21.1	4.59	45
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	14.16	17.32	4.42	29.77
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	15.86	21.42	4.61	45.77
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	16.04	21.74	4.64	47.26
Sum of PFASs (n=30)*	0.1	ug/L	16.49	22.35	4.8	48.63

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Oct 14, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Oct 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Oct 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Oct 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Oct 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 931622
Phone: (07) 3637 2900
Fax:

Received: Oct 14, 2022 9:20 AM
Due: Oct 19, 2022
Priority: 3 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT AREA 1 SP3	Oct 05, 2022		AUS Leachate - Reagent Water	B22-Oc0026114	X	X
2	FOT AREA 1 SP3 DUP	Oct 05, 2022		AUS Leachate - Reagent Water	B22-Oc0026115	X	X
3	FOT AREA 1 SP4	Oct 06, 2022		AUS Leachate - Reagent Water	B22-Oc0026116	X	X
4	FOT AREA 1 SP5	Oct 08, 2022		AUS Leachate - Reagent Water	B22-Oc0026117	X	X
Test Counts						4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Oc0026440	NCP	ug/L	0.05	0.05	3.4	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Oc0026440	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Oc0026440	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Report has been revised to V2 to amend sample ID from FOT A1 SP3 DUP to FOTA2_SP1_3

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

James McCann	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
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QLD 4008

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Attention: **Jack Vahtera**

Report **935482-L**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Oct 27, 2022

Client Sample ID			**FOT AREA 1 SP5 TREATED 1**	**FOT AREA 1 SP5 TREATED 2**	**FOT AREA 1 SP4 TREATED 1**	**FOT AREA 1 SP4 TREATED 2**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-Oc0057486**	**B22-Oc0057487**	**B22-Oc0057488**	**B22-Oc0057489**
Date Sampled			**Oct 25, 2022**	**Oct 25, 2022**	**Oct 26, 2022**	**Oct 26, 2022**
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.0	8.5	9.0	9.0
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	92	108	83	77
13C5-PFPeA (surr.)	1	%	134	158	127	115
13C5-PFHxA (surr.)	1	%	98	113	94	85
13C4-PFHpA (surr.)	1	%	103	114	91	87
13C8-PFOA (surr.)	1	%	101	112	89	88
13C5-PFNA (surr.)	1	%	83	94	77	73
13C6-PFDA (surr.)	1	%	73	80	69	66
13C2-PFUnDA (surr.)	1	%	72	82	64	69
13C2-PFDoDA (surr.)	1	%	81	90	64	75
13C2-PFTeDA (surr.)	1	%	67	80	44	81

Client Sample ID			FOT AREA 1 SP5 TREATED 1	FOT AREA 1 SP5 TREATED 2	FOT AREA 1 SP4 TREATED 1	FOT AREA 1 SP4 TREATED 2
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-Oc0057486	B22-Oc0057487	B22-Oc0057488	B22-Oc0057489
Date Sampled			Oct 25, 2022	Oct 25, 2022	Oct 26, 2022	Oct 26, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	92	101	84	86
D3-N-MeFOSA (surr.)	1	%	114	102	89	121
D5-N-EtFOSA (surr.)	1	%	136	126	96	145
D7-N-MeFOSE (surr.)	1	%	65	78	51	65
D9-N-EtFOSE (surr.)	1	%	67	79	52	65
D5-N-EtFOSAA (surr.)	1	%	73	85	67	68
D3-N-MeFOSAA (surr.)	1	%	74	84	71	67
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.09	[N09]0.01	[N09]0.13	[N09]0.11
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	108	121	100	96
18O2-PFHxS (surr.)	1	%	121	128	109	106
13C8-PFOS (surr.)	1	%	107	115	92	91
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	103	128	89	83
13C2-6:2 FTSA (surr.)	1	%	153	177	137	127
13C2-8:2 FTSA (surr.)	1	%	107	121	92	93
13C2-10:2 FTSA (surr.)	1	%	93	113	49	85
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.09	0.01	0.13	0.11
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.09	0.01	0.13	0.11
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.09	0.01	0.13	0.11
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.09	< 0.05	0.13	0.11
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	0.13	0.11

Client Sample ID			FOT AREA 1 SP4 TREATED 3
Sample Matrix			AUS Leachate - Reagent Water
Eurofins Sample No.			B22-Oc0057490
Date Sampled			Oct 26, 2022
Test/Reference	LOR	Unit	
AUS Leaching Procedure			
Leachate Fluid[C01]		comment	4.0
pH (initial)	0.1	pH Units	N/A
pH (Leachate fluid)	0.1	pH Units	7.0
pH (off)	0.1	pH Units	9.1
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	91
13C5-PFPeA (surr.)	1	%	134
13C5-PFHxA (surr.)	1	%	95
13C4-PFHpA (surr.)	1	%	99
13C8-PFOA (surr.)	1	%	99
13C5-PFNA (surr.)	1	%	82
13C6-PFDA (surr.)	1	%	70
13C2-PFUnDA (surr.)	1	%	70
13C2-PFDoDA (surr.)	1	%	74
13C2-PFTeDA (surr.)	1	%	63
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	96
D3-N-MeFOSA (surr.)	1	%	117
D5-N-EtFOSA (surr.)	1	%	127
D7-N-MeFOSE (surr.)	1	%	63
D9-N-EtFOSE (surr.)	1	%	60
D5-N-EtFOSAA (surr.)	1	%	70
D3-N-MeFOSAA (surr.)	1	%	72

Client Sample ID			FOT AREA 1 SP4 TREATED 3
Sample Matrix			AUS Leachate - Reagent Water
Eurofins Sample No.			B22-Oc0057490
Date Sampled			Oct 26, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.05
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	100
18O2-PFHxS (surr.)	1	%	117
13C8-PFOS (surr.)	1	%	101
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	91
13C2-6:2 FTSA (surr.)	1	%	141
13C2-8:2 FTSA (surr.)	1	%	91
13C2-10:2 FTSA (surr.)	1	%	76
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	0.05
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.05
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.05
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Oct 27, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Oct 27, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Oct 27, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Oct 27, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Oct 27, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 935482
Phone: (07) 3637 2900
Fax:

Received: Oct 27, 2022 11:00 AM
Due: Oct 28, 2022
Priority: 1 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT AREA 1 SP5 TREATED 1	Oct 25, 2022		AUS Leachate - Reagent Water	B22-Oc0057486	X	X
2	FOT AREA 1 SP5 TREATED 2	Oct 25, 2022		AUS Leachate - Reagent Water	B22-Oc0057487	X	X
3	FOT AREA 1 SP4 TREATED 1	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0057488	X	X
4	FOT AREA 1 SP4 TREATED 2	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0057489	X	X
5	FOT AREA 1 SP4 TREATED 3	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0057490	X	X
6	TRIP BLANK	Oct 26, 2022		Water	B22-Oc0057491		X

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
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Order No.:
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Phone: (07) 3637 2900
Fax:

Received: Oct 27, 2022 11:00 AM
Due: Oct 28, 2022
Priority: 1 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794	X	X
Test Counts	5	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S22-Oc0052195	NCP	ug/L	0.12	0.12	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S22-Oc0052195	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-Oc0052195	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-Oc0052195	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-Oc0052195	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-Oc0052195	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-Oc0052195	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-Oc0052195	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Oc0052195	NCP	ug/L	0.07	0.09	28	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-Oc0052195	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-Oc0052195	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Ryan Gilbert	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
1392 Kingsford Smith Drive
Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Jack Vahtera**

Report **935482-W**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Oct 27, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-Oc0057491**
Date Sampled			**Oct 26, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	118
13C5-PFPeA (surr.)	1	%	99
13C5-PFHxA (surr.)	1	%	103
13C4-PFHpA (surr.)	1	%	121
13C8-PFOA (surr.)	1	%	129
13C5-PFNA (surr.)	1	%	77
13C6-PFDA (surr.)	1	%	128
13C2-PFUnDA (surr.)	1	%	124
13C2-PFDoDA (surr.)	1	%	103
13C2-PFTeDA (surr.)	1	%	102
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	87
D3-N-MeFOSA (surr.)	1	%	96

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-Oc0057491
Date Sampled			Oct 26, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	98
D7-N-MeFOSE (surr.)	1	%	114
D9-N-EtFOSE (surr.)	1	%	130
D5-N-EtFOSAA (surr.)	1	%	86
D3-N-MeFOSAA (surr.)	1	%	70
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	106
18O2-PFHxS (surr.)	1	%	97
13C8-PFOS (surr.)	1	%	102
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	80
13C2-6:2 FTSA (surr.)	1	%	84
13C2-8:2 FTSA (surr.)	1	%	108
13C2-10:2 FTSA (surr.)	1	%	72
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Oct 27, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Oct 27, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Oct 27, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Oct 27, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 935482
Phone: (07) 3637 2900
Fax:

Received: Oct 27, 2022 11:00 AM
Due: Oct 28, 2022
Priority: 1 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT AREA 1 SP5 TREATED 1	Oct 25, 2022		AUS Leachate - Reagent Water	B22-Oc0057486	X	X
2	FOT AREA 1 SP5 TREATED 2	Oct 25, 2022		AUS Leachate - Reagent Water	B22-Oc0057487	X	X
3	FOT AREA 1 SP4 TREATED 1	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0057488	X	X
4	FOT AREA 1 SP4 TREATED 2	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0057489	X	X
5	FOT AREA 1 SP4 TREATED 3	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0057490	X	X
6	TRIP BLANK	Oct 26, 2022		Water	B22-Oc0057491		X

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
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QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
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Received: Oct 27, 2022 11:00 AM
Due: Oct 28, 2022
Priority: 1 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794	X	X
Test Counts	5	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	110			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	105			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	111			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	94			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	90			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	112			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	98			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	118			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	115			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	123			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	138			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	83			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	116			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	92			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	106			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	135			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	121			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	117			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	94			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	118			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	134			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	121			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	101			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	124			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	108			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	90			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	136			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	109			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	126			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B22-Oc0050759	NCP	%	106			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Oc0050759	NCP	%	102			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Oc0050759	NCP	%	116			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Oc0050759	NCP	%	87			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-Oc0050759	NCP	%	84			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-Oc0050759	NCP	%	92			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-Oc0050759	NCP	%	92			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Oc0050759	NCP	%	114			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-Oc0050759	NCP	%	113			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-Oc0050759	NCP	%	122			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-Oc0050759	NCP	%	123			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-Oc0050759	NCP	%	88			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Oc0050759	NCP	%	119			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Oc0050759	NCP	%	92			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Oc0050759	NCP	%	127			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Oc0050759	NCP	%	139			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Oc0050759	NCP	%	119			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Oc0050759	NCP	%	128			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-Oc0050759	NCP	%	72			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Oc0050759	NCP	%	105			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Oc0050759	NCP	%	132			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Oc0050759	NCP	%	86			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Oc0050759	NCP	%	107			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-Oc0050759	NCP	%	127			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Oc0050759	NCP	%	103			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-Oc0050759	NCP	%	61			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Oc0050759	NCP	%	108			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Oc0050759	NCP	%	117			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Oc0050759	NCP	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Oc0050759	NCP	%	96			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-Oc0057491	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-Oc0057491	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Oc0057491	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Oc0057491	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Oc0057491	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Oc0057491	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Oc0057491	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Oc0057491	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Oc0057491	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Oc0057491	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Ryan Gilbert	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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1392 Kingsford Smith Drive
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NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **936778-L**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 01, 2022

Client Sample ID			**FOT_AREA 1 SP2 TREATED 1**	**FOT_AREA 1 SP2 TREATED 2**	**FOT_AREA 1 SP2 TREATED 3**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-No0000662**	**B22-No0000663**	**B22-No0000664**
Date Sampled			**Oct 28, 2022**	**Oct 28, 2022**	**Oct 28, 2022**
Test/Reference	LOR	Unit			
AUS Leaching Procedure					
Leachate Fluid[C01]		comment	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0
pH (off)	0.1	pH Units	8.8	8.9	8.9
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	104	96	98
13C5-PFPeA (surr.)	1	%	98	92	98
13C5-PFHxA (surr.)	1	%	90	91	99
13C4-PFHpA (surr.)	1	%	100	93	104
13C8-PFOA (surr.)	1	%	99	92	112
13C5-PFNA (surr.)	1	%	101	92	108
13C6-PFDA (surr.)	1	%	125	114	137
13C2-PFUnDA (surr.)	1	%	114	109	133
13C2-PFDoDA (surr.)	1	%	79	82	93
13C2-PFTeDA (surr.)	1	%	60	65	65

Client Sample ID			FOT_AREA 1 SP2 TREATED 1	FOT_AREA 1 SP2 TREATED 2	FOT_AREA 1 SP2 TREATED 3
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0000662	B22-No0000663	B22-No0000664
Date Sampled			Oct 28, 2022	Oct 28, 2022	Oct 28, 2022
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	108	100	108
D3-N-MeFOSA (surr.)	1	%	68	67	71
D5-N-EtFOSA (surr.)	1	%	54	56	62
D7-N-MeFOSE (surr.)	1	%	74	77	89
D9-N-EtFOSE (surr.)	1	%	68	71	93
D5-N-EtFOSAA (surr.)	1	%	73	72	84
D3-N-MeFOSAA (surr.)	1	%	85	85	93
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.09	[N09]0.07	[N09]0.08
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	115	115	128
18O2-PFHxS (surr.)	1	%	123	120	135
13C8-PFOS (surr.)	1	%	105	97	109
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	105	84	94
13C2-6:2 FTSA (surr.)	1	%	100	91	87
13C2-8:2 FTSA (surr.)	1	%	97	79	92
13C2-10:2 FTSA (surr.)	1	%	107	98	103
PFASs Summations					
Sum (PFHxS + PFOS)*	0.01	ug/L	0.09	0.07	0.08
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.09	0.07	0.08
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.09	0.07	0.08
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.09	0.07	0.08
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Nov 01, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 01, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 01, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 01, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 01, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 936778
Phone: (07) 3637 2900
Fax:

Received: Nov 1, 2022 10:34 AM
Due: Nov 2, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	FOT_AREA 1 SP2 TREATED 1	Oct 28, 2022		AUS Leachate - Reagent Water	B22-No0000662	X		X
2	FOT_AREA 1 SP2 TREATED 2	Oct 28, 2022		AUS Leachate - Reagent Water	B22-No0000663	X		X
3	FOT_AREA 1 SP2 TREATED 3	Oct 28, 2022		AUS Leachate - Reagent Water	B22-No0000664	X		X
4	FOT_AREA 1 SP2 TREATED 1	Oct 28, 2022		Soil	B22-No0000665		X	
5	FOT_AREA 1 SP2 TREATED 2	Oct 28, 2022		Soil	B22-No0000666		X	
6	FOT_AREA 1 SP2	Oct 28, 2022		Soil	B22-No0000667		X	

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 936778
Phone: (07) 3637 2900
Fax:

Received: Nov 1, 2022 10:34 AM
Due: Nov 2, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail	AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794	X	X	X
TREATED 3			
Test Counts	3	3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0000664	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0000664	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0000664	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0000664	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0000664	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0000664	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0000664	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0000664	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0000664	CP	ug/L	0.08	0.08	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0000664	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0000664	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

James McCann	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
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Attention: **Jack Vahtera**

Report **936472-L-V2**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Oct 31, 2022

Client Sample ID			**FOT AREA 1 SP4 TREATED 4**	**FOT Area 1 SP4 Treated 4 Dup**	**FOT AREA 1 SP3 TREATED 1**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-Oc0065886**	**B22-Oc0065887**	**B22-Oc0065889**
Date Sampled			**Oct 26, 2022**	**Oct 26, 2022**	**Oct 26, 2022**
Test/Reference	LOR	Unit			
AUS Leaching Procedure					
Leachate Fluid[C01]		comment	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.0	9.0	9.2
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	96	101	109
13C5-PFPeA (surr.)	1	%	96	101	101
13C5-PFHxA (surr.)	1	%	96	100	91
13C4-PFHpA (surr.)	1	%	106	112	98
13C8-PFOA (surr.)	1	%	101	114	123
13C5-PFNA (surr.)	1	%	93	112	98
13C6-PFDA (surr.)	1	%	95	120	93
13C2-PFUnDA (surr.)	1	%	85	116	83
13C2-PFDoDA (surr.)	1	%	83	99	104
13C2-PFTeDA (surr.)	1	%	77	84	83

Client Sample ID			FOT AREA 1 SP4 TREATED 4	FOT Area 1 SP4 Treated 4 Dup	FOT AREA 1 SP3 TREATED 1
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-Oc0065886	B22-Oc0065887	B22-Oc0065889
Date Sampled			Oct 26, 2022	Oct 26, 2022	Oct 26, 2022
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	112	126	108
D3-N-MeFOSA (surr.)	1	%	96	94	144
D5-N-EtFOSA (surr.)	1	%	85	82	131
D7-N-MeFOSE (surr.)	1	%	92	94	92
D9-N-EtFOSE (surr.)	1	%	82	84	82
D5-N-EtFOSAA (surr.)	1	%	66	85	85
D3-N-MeFOSAA (surr.)	1	%	85	121	91
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.02	[N09]0.02	[N09]0.05
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	127	137	131
18O2-PFHxS (surr.)	1	%	111	126	114
13C8-PFOS (surr.)	1	%	110	135	103
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	81	76	89
13C2-6:2 FTSA (surr.)	1	%	152	168	117
13C2-8:2 FTSA (surr.)	1	%	74	121	82
13C2-10:2 FTSA (surr.)	1	%	68	104	73
PFASs Summations					
Sum (PFHxS + PFOS)*	0.01	ug/L	0.02	0.02	0.05
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.02	0.02	0.05
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.02	0.02	0.05
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Oct 31, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Oct 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Oct 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Oct 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Oct 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 936472
Phone: (07) 3637 2900
Fax:

Received: Oct 31, 2022 12:40 PM
Due: Nov 1, 2022
Priority: 1 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT AREA 1 SP4 TREATED 4	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0065886	X	X
2	FOT AREA 1 SP4 TREATED 5	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0065887	X	X
3	TRIP BLANK	Oct 26, 2022		Water	B22-Oc0065888		X
4	FOT AREA 1 SP3 TREATED 1	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0065889	X	X
Test Counts						3	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-Oc0056234	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-Oc0056234	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Oc0056234	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Oc0056234	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Oc0056234	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Oc0056234	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Oc0056234	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Oc0056234	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Oc0056234	NCP	ug/L	0.02	0.02	2.4	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Oc0056234	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Oc0056234	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

This report has been revised (V2) to correct sample name FOT Area 1 SP4 Treated 5 to FOT Area 1 SP4 Treated 4 Dup

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

James McCann	Analytical Services Manager
Sarah McCallion	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
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Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Jack Vahtera**

Report **936472-W**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Oct 31, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-Oc0065888**
Date Sampled			**Oct 26, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	107
13C5-PFPeA (surr.)	1	%	103
13C5-PFHxA (surr.)	1	%	109
13C4-PFHpA (surr.)	1	%	89
13C8-PFOA (surr.)	1	%	117
13C5-PFNA (surr.)	1	%	115
13C6-PFDA (surr.)	1	%	121
13C2-PFUnDA (surr.)	1	%	120
13C2-PFDoDA (surr.)	1	%	103
13C2-PFTeDA (surr.)	1	%	103
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	99
D3-N-MeFOSA (surr.)	1	%	105

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-Oc0065888
Date Sampled			Oct 26, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	121
D7-N-MeFOSE (surr.)	1	%	77
D9-N-EtFOSE (surr.)	1	%	79
D5-N-EtFOSAA (surr.)	1	%	90
D3-N-MeFOSAA (surr.)	1	%	108
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	107
18O2-PFHxS (surr.)	1	%	91
13C8-PFOS (surr.)	1	%	100
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	110
13C2-6:2 FTSA (surr.)	1	%	66
13C2-8:2 FTSA (surr.)	1	%	101
13C2-10:2 FTSA (surr.)	1	%	142
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Oct 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Oct 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Oct 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Oct 31, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 936472
Phone: (07) 3637 2900
Fax:

Received: Oct 31, 2022 12:40 PM
Due: Nov 1, 2022
Priority: 1 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT AREA 1 SP4 TREATED 4	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0065886	X	X
2	FOT AREA 1 SP4 TREATED 5	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0065887	X	X
3	TRIP BLANK	Oct 26, 2022		Water	B22-Oc0065888		X
4	FOT AREA 1 SP3 TREATED 1	Oct 26, 2022		AUS Leachate - Reagent Water	B22-Oc0065889	X	X
Test Counts						3	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	107			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	103			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	115			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	94			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	91			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	108			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	98			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	112			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	109			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	140			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	120			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	85			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	93			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	84			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	113			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	99			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	118			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	115			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	93			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	133			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	126			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	69			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	103			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	104			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	106			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	101			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	120			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	119			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	S22-Oc0034084	NCP	%	106			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S22-Oc0034084	NCP	%	104			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S22-Oc0034084	NCP	%	113			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-Oc0034084	NCP	%	88			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S22-Oc0034084	NCP	%	81			50-150	Pass	
Perfluorononanoic acid (PFNA)	S22-Oc0034084	NCP	%	100			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S22-Oc0034084	NCP	%	96			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-Oc0034084	NCP	%	100			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S22-Oc0034084	NCP	%	104			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-Oc0034084	NCP	%	120			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-Oc0034084	NCP	%	111			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	S22-Oc0034084	NCP	%	83			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-Oc0034084	NCP	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-Oc0034084	NCP	%	87			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-Oc0034084	NCP	%	100			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-Oc0034084	NCP	%	95			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-Oc0034084	NCP	%	111			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-Oc0034084	NCP	%	114			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S22-Oc0034084	NCP	%	91			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-Oc0034084	NCP	%	129			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-Oc0034084	NCP	%	120			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-Oc0034084	NCP	%	76			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Oc0034084	NCP	%	73			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-Oc0034084	NCP	%	98			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Oc0034084	NCP	%	121			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-Oc0034084	NCP	%	98			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-Oc0034084	NCP	%	122			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-Oc0034084	NCP	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-Oc0034084	NCP	%	112			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-Oc0034084	NCP	%	113			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S22-Oc0058977	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S22-Oc0058977	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-Oc0058977	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-Oc0058977	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-Oc0058977	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-Oc0058977	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-Oc0058977	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-Oc0058977	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-Oc0058977	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-Oc0058977	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Attention: **Quentin Xu**

Report **937457-L**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 03, 2022

Client Sample ID			FOT AREA 1 SP3 TREATED 2	FOT AREA 1 SP3 TREATED 3	FOT AREA 1 SP3 TREATED 3 DUP	FOT AREA 2 SP2 TREATED 1
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0006070	B22-No0006071	B22-No0006072	B22-No0006073
Date Sampled			Oct 31, 2022	Oct 31, 2022	Oct 31, 2022	Nov 02, 2022
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	8.7	8.9	8.9	8.9
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	132	127	125	126
13C5-PFPeA (surr.)	1	%	106	103	108	104
13C5-PFHxA (surr.)	1	%	108	97	111	101
13C4-PFHpA (surr.)	1	%	149	129	141	135
13C8-PFOA (surr.)	1	%	111	105	110	107
13C5-PFNA (surr.)	1	%	141	138	140	138
13C6-PFDA (surr.)	1	%	132	128	132	130
13C2-PFUnDA (surr.)	1	%	127	111	113	117
13C2-PFDoDA (surr.)	1	%	78	78	73	82
13C2-PFTeDA (surr.)	1	%	64	60	53	67

Client Sample ID			FOT AREA 1 SP3 TREATED 2	FOT AREA 1 SP3 TREATED 3	FOT AREA 1 SP3 TREATED 3 DUP	FOT AREA 2 SP2 TREATED 1
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0006070	B22-No0006071	B22-No0006072	B22-No0006073
Date Sampled			Oct 31, 2022	Oct 31, 2022	Oct 31, 2022	Nov 02, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	118	112	120	112
D3-N-MeFOSA (surr.)	1	%	96	93	87	92
D5-N-EtFOSA (surr.)	1	%	75	70	64	73
D7-N-MeFOSE (surr.)	1	%	79	84	77	104
D9-N-EtFOSE (surr.)	1	%	88	89	82	108
D5-N-EtFOSAA (surr.)	1	%	91	89	83	90
D3-N-MeFOSAA (surr.)	1	%	121	111	108	111
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.08	[N09]0.06	[N09]0.06	[N09]0.05
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	122	120	123	126
18O2-PFHxS (surr.)	1	%	126	122	126	126
13C8-PFOS (surr.)	1	%	112	113	118	113
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	101	89	85	93
13C2-6:2 FTSA (surr.)	1	%	95	89	85	87
13C2-8:2 FTSA (surr.)	1	%	99	100	98	94
13C2-10:2 FTSA (surr.)	1	%	124	119	120	121
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.09	0.06	0.06	0.05
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.08	0.06	0.06	0.05
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.09	0.06	0.06	0.05
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.09	0.06	0.06	0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

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Client Sample ID			FOT AREA 2 SP2 TREATED 2	FOT AREA 2 SP2 TREATED 3	FOT AREA 2 SP2 TREATED 4
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0006074	B22-No0006075	B22-No0006076
Date Sampled			Nov 02, 2022	Nov 02, 2022	Nov 02, 2022
Test/Reference	LOR	Unit			
AUS Leaching Procedure					
Leachate Fluid[C01]		comment	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.0	9.0	9.0
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	125	131	124
13C5-PFPeA (surr.)	1	%	106	104	104
13C5-PFHxA (surr.)	1	%	106	106	104
13C4-PFHpA (surr.)	1	%	135	144	133
13C8-PFOA (surr.)	1	%	100	105	105
13C5-PFNA (surr.)	1	%	133	140	132
13C6-PFDA (surr.)	1	%	130	133	132
13C2-PFUnDA (surr.)	1	%	115	117	119
13C2-PFDoDA (surr.)	1	%	85	74	87
13C2-PFTeDA (surr.)	1	%	75	55	80
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	109	112	110
D3-N-MeFOSA (surr.)	1	%	95	81	98
D5-N-EtFOSA (surr.)	1	%	76	63	81
D7-N-MeFOSE (surr.)	1	%	103	86	89
D9-N-EtFOSE (surr.)	1	%	102	88	104
D5-N-EtFOSAA (surr.)	1	%	97	89	94
D3-N-MeFOSAA (surr.)	1	%	115	107	109

Client Sample ID			FOT AREA 2 SP2 TREATED 2	FOT AREA 2 SP2 TREATED 3	FOT AREA 2 SP2 TREATED 4
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0006074	B22-No0006075	B22-No0006076
Date Sampled			Nov 02, 2022	Nov 02, 2022	Nov 02, 2022
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.06	[N09]0.05	0.06
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	121	119	120
18O2-PFHxS (surr.)	1	%	121	120	122
13C8-PFOS (surr.)	1	%	115	117	113
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	83	100	91
13C2-6:2 FTSA (surr.)	1	%	75	90	86
13C2-8:2 FTSA (surr.)	1	%	92	97	101
13C2-10:2 FTSA (surr.)	1	%	116	114	125
PFASs Summations					
Sum (PFHxS + PFOS)*	0.01	ug/L	0.06	0.05	0.06
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.06	0.05	0.06
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.06	0.05	0.06
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.06	0.05	0.06
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1

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Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Nov 03, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 03, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 03, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 03, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 03, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 937457
Phone: (07) 3637 2900
Fax:

Received: Nov 3, 2022 10:30 AM
Due: Nov 4, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

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Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT AREA 1 SP3 TREATED 2	Oct 31, 2022		AUS Leachate - Reagent Water	B22-No0006070	X	X
2	FOT AREA 1 SP3 TREATED 3	Oct 31, 2022		AUS Leachate - Reagent Water	B22-No0006071	X	X
3	FOT AREA 1 SP3 TREATED 3 DUP	Oct 31, 2022		AUS Leachate - Reagent Water	B22-No0006072	X	X
4	FOT AREA 2 SP2 TREATED 1	Nov 02, 2022		AUS Leachate - Reagent Water	B22-No0006073	X	X
5	FOT AREA 2 SP2 TREATED 2	Nov 02, 2022		AUS Leachate - Reagent Water	B22-No0006074	X	X
6	FOT AREA 2	Nov 02, 2022		AUS Leachate	B22-No0006075	X	X

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Phone: (07) 3637 2900
Fax:

Received: Nov 3, 2022 10:30 AM
Due: Nov 4, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

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Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
	SP2 TREATED 3			- Reagent Water			
7	FOT AREA 2 SP2 TREATED 4	Nov 02, 2022		AUS Leachate - Reagent Water	B22-No0006076	X	X
8	TRIP BLANK	Nov 02, 2022		Water	B22-No0006077		X
Test Counts						7	8

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S22-Oc0064610	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S22-Oc0064610	NCP	ug/L	0.02	0.02	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-Oc0064610	NCP	ug/L	0.02	0.02	1.2	30%	Pass	
Perfluorononanoic acid (PFNA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S22-Oc0064610	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-Oc0064610	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-Oc0064610	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-Oc0064610	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-Oc0064610	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-Oc0064610	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-Oc0064610	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-Oc0064610	NCP	ug/L	0.03	0.04	8.6	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-Oc0064610	NCP	ug/L	0.01	0.01	9.2	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-Oc0064610	NCP	ug/L	0.61	0.58	5.1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-Oc0064610	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-Oc0064610	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

DRAFT

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties

Glenn Jackson
General Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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DRAFT

Enviropacific Services P/L (QLD)
1392 Kingsford Smith Drive
Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

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Attention: **Quentin Xu**

Report **937899-L**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 04, 2022

Client Sample ID			**FTG SP1 TREATED 1**	**FTG SP1 TREATED 2**	**FTG SP1 TREATED 3**	**FTG SP2 TREATED 1**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-No0009758**	**B22-No0009759**	**B22-No0009760**	**B22-No0009761**
Date Sampled			**Nov 02, 2022**	**Nov 02, 2022**	**Nov 03, 2022**	**Nov 03, 2022**
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.3	9.1	9.2	9.2
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	122	124	120	141
13C5-PFPeA (surr.)	1	%	100	105	98	117
13C5-PFHxA (surr.)	1	%	98	103	100	110
13C4-PFHpA (surr.)	1	%	111	106	110	127
13C8-PFOA (surr.)	1	%	99	100	103	115
13C5-PFNA (surr.)	1	%	102	104	99	121
13C6-PFDA (surr.)	1	%	91	98	92	114
13C2-PFUnDA (surr.)	1	%	88	92	87	114
13C2-PFDoDA (surr.)	1	%	90	94	95	114
13C2-PFTeDA (surr.)	1	%	79	74	74	107
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			FTG SP1 TREATED 1	FTG SP1 TREATED 2	FTG SP1 TREATED 3	FTG SP2 TREATED 1
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0009758	B22-No0009759	B22-No0009760	B22-No0009761
Date Sampled			Nov 02, 2022	Nov 02, 2022	Nov 03, 2022	Nov 03, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	108	115	110	131
D3-N-MeFOSA (surr.)	1	%	107	105	108	103
D5-N-EtFOSA (surr.)	1	%	97	95	105	98
D7-N-MeFOSE (surr.)	1	%	87	79	85	86
D9-N-EtFOSE (surr.)	1	%	86	76	84	82
D5-N-EtFOSAA (surr.)	1	%	89	90	90	111
D3-N-MeFOSAA (surr.)	1	%	88	84	85	104
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	126	124	114	135
18O2-PFHxS (surr.)	1	%	107	101	109	117
13C8-PFOS (surr.)	1	%	111	112	107	130
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	97	87	87	107
13C2-6:2 FTSA (surr.)	1	%	90	108	90	109
13C2-8:2 FTSA (surr.)	1	%	91	86	88	97
13C2-10:2 FTSA (surr.)	1	%	87	92	94	113
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			FTG SP2 TREATED 2	FTG SP2 TREATED 3	FTG SP2 TREATED 4	FTG SP2 TREATED 5
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0009762	B22-No0009763	B22-No0009764	B22-No0009765
Date Sampled			Nov 03, 2022	Nov 03, 2022	Nov 03, 2022	Nov 03, 2022
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.0	9.0	9.1	9.2
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	126	114	119	123
13C5-PFPeA (surr.)	1	%	106	98	99	101
13C5-PFHxA (surr.)	1	%	108	98	98	99
13C4-PFHpA (surr.)	1	%	115	107	101	104
13C8-PFOA (surr.)	1	%	100	95	96	101
13C5-PFNA (surr.)	1	%	107	97	98	102
13C6-PFDA (surr.)	1	%	102	91	93	95
13C2-PFUnDA (surr.)	1	%	97	85	89	92
13C2-PFDoDA (surr.)	1	%	96	84	96	92
13C2-PFTeDA (surr.)	1	%	80	74	80	82
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	115	100	108	113
D3-N-MeFOSA (surr.)	1	%	92	91	98	100
D5-N-EtFOSA (surr.)	1	%	87	88	94	96
D7-N-MeFOSE (surr.)	1	%	73	73	77	85
D9-N-EtFOSE (surr.)	1	%	79	78	80	88
D5-N-EtFOSAA (surr.)	1	%	91	78	87	90
D3-N-MeFOSAA (surr.)	1	%	89	73	83	86

Client Sample ID			FTG SP2 TREATED 2	FTG SP2 TREATED 3	FTG SP2 TREATED 4	FTG SP2 TREATED 5
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0009762	B22-No0009763	B22-No0009764	B22-No0009765
Date Sampled			Nov 03, 2022	Nov 03, 2022	Nov 03, 2022	Nov 03, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	134	114	125	126
18O2-PFHxS (surr.)	1	%	113	101	106	106
13C8-PFOS (surr.)	1	%	116	97	107	106
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	96	88	87	93
13C2-6:2 FTSA (surr.)	1	%	98	92	89	87
13C2-8:2 FTSA (surr.)	1	%	90	86	89	87
13C2-10:2 FTSA (surr.)	1	%	92	79	89	93
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			FTG SP2 TREATED 6	FTG SP2 TREATED 6 DUP
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0009766	B22-No0009767
Date Sampled			Nov 03, 2022	Nov 03, 2022
Test/Reference	LOR	Unit		
AUS Leaching Procedure				
Leachate Fluid[C01]		comment	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0
pH (off)	0.1	pH Units	9.2	9.2

Client Sample ID			FTG SP2 TREATED 6	FTG SP2 TREATED 6 DUP
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0009766	B22-No0009767
Date Sampled			Nov 03, 2022	Nov 03, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	126	116
13C5-PFPeA (surr.)	1	%	106	93
13C5-PFHxA (surr.)	1	%	105	83
13C4-PFHpA (surr.)	1	%	110	96
13C8-PFOA (surr.)	1	%	99	90
13C5-PFNA (surr.)	1	%	104	91
13C6-PFDA (surr.)	1	%	100	84
13C2-PFUnDA (surr.)	1	%	95	80
13C2-PFDoDA (surr.)	1	%	99	83
13C2-PFTeDA (surr.)	1	%	87	66
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	116	97
D3-N-MeFOSA (surr.)	1	%	113	86
D5-N-EtFOSA (surr.)	1	%	105	79
D7-N-MeFOSE (surr.)	1	%	82	62
D9-N-EtFOSE (surr.)	1	%	81	61
D5-N-EtFOSAA (surr.)	1	%	94	79
D3-N-MeFOSAA (surr.)	1	%	89	75
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01

Client Sample ID			FTG SP2 TREATED 6	FTG SP2 TREATED 6 DUP
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0009766	B22-No0009767
Date Sampled			Nov 03, 2022	Nov 03, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	128	111
18O2-PFHxS (surr.)	1	%	109	94
13C8-PFOS (surr.)	1	%	106	96
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	100	83
13C2-6:2 FTSA (surr.)	1	%	92	82
13C2-8:2 FTSA (surr.)	1	%	99	75
13C2-10:2 FTSA (surr.)	1	%	88	83
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Nov 04, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 04, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 04, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 04, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 04, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 937899
Phone: (07) 3637 2900
Fax:

Received: Nov 4, 2022 10:30 AM
Due: Nov 7, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FTG SP1 TREATED 1	Nov 02, 2022		AUS Leachate - Reagent Water	B22-No0009758	X	X
2	FTG SP1 TREATED 2	Nov 02, 2022		AUS Leachate - Reagent Water	B22-No0009759	X	X
3	FTG SP1 TREATED 3	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009760	X	X
4	FTG SP2 TREATED 1	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009761	X	X
5	FTG SP2 TREATED 2	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009762	X	X
6	FTG SP2 TREATED 3	Nov 03, 2022		AUS Leachate - Reagent	B22-No0009763	X	X

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Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 937899
Phone: (07) 3637 2900
Fax:

Received: Nov 4, 2022 10:30 AM
Due: Nov 7, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
				Water			
7	FTG SP2 TREATED 4	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009764	X	X
8	FTG SP2 TREATED 5	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009765	X	X
9	FTG SP2 TREATED 6	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009766	X	X
10	FTG SP2 TREATED 6 DUP	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009767	X	X
11	TRIP BLANK	Nov 03, 2022		Water	B22-No0009768		X
Test Counts						10	11

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S22-No0009572	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S22-No0009572	NCP	ug/L	0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-No0009572	NCP	ug/L	0.02	0.02	13	30%	Pass	
Perfluorononanoic acid (PFNA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S22-No0009572	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-No0009572	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-No0009572	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-No0009572	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-No0009572	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-No0009572	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-No0009572	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0013103	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-No0009572	NCP	ug/L	0.20	0.21	4.4	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-No0009572	NCP	ug/L	0.12	0.12	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0013103	NCP	ug/L	0.05	0.04	11	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0013103	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-No0009572	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-No0009572	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

James McCann	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
1392 Kingsford Smith Drive
Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **937899-W**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 04, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-No0009768**
Date Sampled			**Nov 03, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	98
13C5-PFPeA (surr.)	1	%	116
13C5-PFHxA (surr.)	1	%	129
13C4-PFHpA (surr.)	1	%	195
13C8-PFOA (surr.)	1	%	114
13C5-PFNA (surr.)	1	%	116
13C6-PFDA (surr.)	1	%	125
13C2-PFUnDA (surr.)	1	%	126
13C2-PFDoDA (surr.)	1	%	181
13C2-PFTeDA (surr.)	1	%	127
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	100
D3-N-MeFOSA (surr.)	1	%	86

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-No0009768
Date Sampled			Nov 03, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	87
D7-N-MeFOSE (surr.)	1	%	62
D9-N-EtFOSE (surr.)	1	%	70
D5-N-EtFOSAA (surr.)	1	%	141
D3-N-MeFOSAA (surr.)	1	%	93
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	116
18O2-PFHxS (surr.)	1	%	139
13C8-PFOS (surr.)	1	%	133
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	126
13C2-6:2 FTSA (surr.)	1	%	107
13C2-8:2 FTSA (surr.)	1	%	INT
13C2-10:2 FTSA (surr.)	1	%	112
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 04, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 04, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 04, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 04, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
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QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 937899
Phone: (07) 3637 2900
Fax:

Received: Nov 4, 2022 10:30 AM
Due: Nov 7, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FTG SP1 TREATED 1	Nov 02, 2022		AUS Leachate - Reagent Water	B22-No0009758	X	X
2	FTG SP1 TREATED 2	Nov 02, 2022		AUS Leachate - Reagent Water	B22-No0009759	X	X
3	FTG SP1 TREATED 3	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009760	X	X
4	FTG SP2 TREATED 1	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009761	X	X
5	FTG SP2 TREATED 2	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009762	X	X
6	FTG SP2 TREATED 3	Nov 03, 2022		AUS Leachate - Reagent	B22-No0009763	X	X

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QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 937899
Phone: (07) 3637 2900
Fax:

Received: Nov 4, 2022 10:30 AM
Due: Nov 7, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
				Water			
7	FTG SP2 TREATED 4	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009764	X	X
8	FTG SP2 TREATED 5	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009765	X	X
9	FTG SP2 TREATED 6	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009766	X	X
10	FTG SP2 TREATED 6 DUP	Nov 03, 2022		AUS Leachate - Reagent Water	B22-No0009767	X	X
11	TRIP BLANK	Nov 03, 2022		Water	B22-No0009768		X
Test Counts						10	11

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	91			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	97			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	77			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	79			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	100			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	93			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	97			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	99			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	123			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	105			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	100			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	76			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	76			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	101			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	105			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	102			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	102			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	68			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	109			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	94			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	52			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	92			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	89			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	69			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	119			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	105			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B22-No0009768	CP	%	83			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0009768	CP	%	89			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0009768	CP	%	84			50-150	Pass	Q05
Perfluoroheptanoic acid (PFHpA)	B22-No0009768	CP	%	81			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0009768	CP	%	83			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-No0009768	CP	%	102			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0009768	CP	%	80			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0009768	CP	%	94			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0009768	CP	%	97			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0009768	CP	%	130			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0009768	CP	%	100			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-No0009768	CP	%	97			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0009768	CP	%	79			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0009768	CP	%	79			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0009768	CP	%	93			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0009768	CP	%	109			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0009768	CP	%	97			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0009768	CP	%	100			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-No0009768	CP	%	76			50-150	Pass	Q05
Perfluorononanesulfonic acid (PFNS)	B22-No0009768	CP	%	83			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0009768	CP	%	84			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0009768	CP	%	61			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0009768	CP	%	89			50-150	Pass	Q05
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0009768	CP	%	91			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0009768	CP	%	83			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0009768	CP	%	69			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0009768	CP	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0009768	CP	%	86			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0009768	CP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0009768	CP	%	97			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0006077	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0006077	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0006077	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0006077	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0006077	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0006077	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0006077	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0006077	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0006077	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0006077	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q05	The matrix spike concentration is less than five times the background concentration in the sample - therefore the spike recovery cannot be determined

Authorised by:

James McCann	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
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Attention: **Quentin Xu**

Report **938676-L**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 08, 2022

Client Sample ID			**FOT A3 SP6 TREATED 1**	**FOT A3 SP6 TREATED 2**	**FOT A3 SP6 TREATED 3**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-No0015669**	**B22-No0015670**	**B22-No0015671**
Date Sampled			**Nov 07, 2022**	**Nov 07, 2022**	**Nov 07, 2022**
Test/Reference	LOR	Unit			
AUS Leaching Procedure					
Leachate Fluid[C01]		comment	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.2	9.2	9.2
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	98	92	94
13C5-PFPeA (surr.)	1	%	107	100	103
13C5-PFHxA (surr.)	1	%	111	97	102
13C4-PFHpA (surr.)	1	%	107	104	103
13C8-PFOA (surr.)	1	%	95	100	92
13C5-PFNA (surr.)	1	%	99	95	90
13C6-PFDA (surr.)	1	%	134	128	130
13C2-PFUnDA (surr.)	1	%	105	102	104
13C2-PFDoDA (surr.)	1	%	91	90	93
13C2-PFTeDA (surr.)	1	%	69	69	82
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05

Client Sample ID			FOT A3 SP6 TREATED 1	FOT A3 SP6 TREATED 2	FOT A3 SP6 TREATED 3
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0015669	B22-No0015670	B22-No0015671
Date Sampled			Nov 07, 2022	Nov 07, 2022	Nov 07, 2022
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	98	94	90
D3-N-MeFOSA (surr.)	1	%	104	103	107
D5-N-EtFOSA (surr.)	1	%	84	98	86
D7-N-MeFOSE (surr.)	1	%	66	61	59
D9-N-EtFOSE (surr.)	1	%	62	65	54
D5-N-EtFOSAA (surr.)	1	%	99	96	97
D3-N-MeFOSAA (surr.)	1	%	85	79	78
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.04	[N09]0.03	[N09]0.03
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	104	107	100
18O2-PFHxS (surr.)	1	%	101	97	99
13C8-PFOS (surr.)	1	%	91	88	86
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	115	97	104
13C2-6:2 FTSA (surr.)	1	%	92	83	86
13C2-8:2 FTSA (surr.)	1	%	87	82	80
13C2-10:2 FTSA (surr.)	1	%	72	69	70
PFASs Summations					
Sum (PFHxS + PFOS)*	0.01	ug/L	0.04	0.03	0.03
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.04	0.03	0.03
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.04	0.03	0.03
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Nov 08, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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Address: 1392 Kingsford Smith Drive
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QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 938676
Phone: (07) 3637 2900
Fax:

Received: Nov 8, 2022 9:30 AM
Due: Nov 9, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A3 SP6 TREATED 1	Nov 07, 2022		AUS Leachate - Reagent Water	B22-No0015669	X	X
2	FOT A3 SP6 TREATED 2	Nov 07, 2022		AUS Leachate - Reagent Water	B22-No0015670	X	X
3	FOT A3 SP6 TREATED 3	Nov 07, 2022		AUS Leachate - Reagent Water	B22-No0015671	X	X
4	TRIP BLANK	Nov 07, 2022		Water	B22-No0015672		X
Test Counts						3	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0015669	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0015669	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0015669	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0015669	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0015669	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0015669	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0015669	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0015669	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0015669	CP	ug/L	0.04	0.04	3.2	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0015669	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0015669	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **938676-W**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 08, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-No0015672**
Date Sampled			**Nov 07, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	129
13C5-PFPeA (surr.)	1	%	108
13C5-PFHxA (surr.)	1	%	107
13C4-PFHpA (surr.)	1	%	118
13C8-PFOA (surr.)	1	%	106
13C5-PFNA (surr.)	1	%	109
13C6-PFDA (surr.)	1	%	142
13C2-PFUnDA (surr.)	1	%	138
13C2-PFDoDA (surr.)	1	%	127
13C2-PFTeDA (surr.)	1	%	125
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	87
D3-N-MeFOSA (surr.)	1	%	92

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-No0015672
Date Sampled			Nov 07, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	97
D7-N-MeFOSE (surr.)	1	%	59
D9-N-EtFOSE (surr.)	1	%	65
D5-N-EtFOSAA (surr.)	1	%	104
D3-N-MeFOSAA (surr.)	1	%	124
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	121
18O2-PFHxS (surr.)	1	%	113
13C8-PFOS (surr.)	1	%	117
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	112
13C2-6:2 FTSA (surr.)	1	%	94
13C2-8:2 FTSA (surr.)	1	%	101
13C2-10:2 FTSA (surr.)	1	%	139
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 08, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 938676
Phone: (07) 3637 2900
Fax:

Received: Nov 8, 2022 9:30 AM
Due: Nov 9, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A3 SP6 TREATED 1	Nov 07, 2022		AUS Leachate - Reagent Water	B22-No0015669	X	X
2	FOT A3 SP6 TREATED 2	Nov 07, 2022		AUS Leachate - Reagent Water	B22-No0015670	X	X
3	FOT A3 SP6 TREATED 3	Nov 07, 2022		AUS Leachate - Reagent Water	B22-No0015671	X	X
4	TRIP BLANK	Nov 07, 2022		Water	B22-No0015672		X
Test Counts						3	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	97			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	111			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	92			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	92			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	106			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	91			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	103			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	104			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	112			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	102			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	91			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	99			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	82			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	113			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	108			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	112			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	121			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	83			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	125			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	112			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	67			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	98			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	108			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	99			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	96			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	119			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	122			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	99			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	N22-No0006907	NCP	%	93			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	N22-No0006907	NCP	%	90			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	N22-No0006907	NCP	%	104			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	N22-No0006907	NCP	%	87			50-150	Pass	
Perfluorooctanoic acid (PFOA)	N22-No0006907	NCP	%	72			50-150	Pass	
Perfluorononanoic acid (PFNA)	N22-No0006907	NCP	%	85			50-150	Pass	
Perfluorodecanoic acid (PFDA)	N22-No0006907	NCP	%	86			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	N22-No0006907	NCP	%	96			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	N22-No0006907	NCP	%	104			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	N22-No0006907	NCP	%	97			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	N22-No0006907	NCP	%	100			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	N22-No0006907	NCP	%	92			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	N22-No0006907	NCP	%	90			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	N22-No0006907	NCP	%	78			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	N22-No0006907	NCP	%	112			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	N22-No0006907	NCP	%	103			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	N22-No0006907	NCP	%	111			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	N22-No0006907	NCP	%	109			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	N22-No0006907	NCP	%	80			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	N22-No0006907	NCP	%	125			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	N22-No0006907	NCP	%	111			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	N22-No0006907	NCP	%	78			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	N22-No0006907	NCP	%	87			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	N22-No0006907	NCP	%	131			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	N22-No0006907	NCP	%	108			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	N22-No0006907	NCP	%	108			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	N22-No0006907	NCP	%	133			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	N22-No0006907	NCP	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	N22-No0006907	NCP	%	122			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	N22-No0006907	NCP	%	96			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0015672	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0015672	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0015672	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0015672	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0015672	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0015672	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0015672	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0015672	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0015672	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0015672	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Jack Vahtera**

Report **938297-L**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 07, 2022

Client Sample ID			**FOT A4 SP1 TREATED 1**	**FOT A2 SP1 TREATED 1**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-No0013102**	**B22-No0013103**
Date Sampled			**Nov 04, 2022**	**Nov 04, 2022**
Test/Reference	LOR	Unit		
AUS Leaching Procedure				
Leachate Fluid[C01]		comment	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0
pH (off)	0.1	pH Units	9.0	9.1
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	134	127
13C5-PFPeA (surr.)	1	%	113	98
13C5-PFHxA (surr.)	1	%	113	88
13C4-PFHpA (surr.)	1	%	129	104
13C8-PFOA (surr.)	1	%	117	94
13C5-PFNA (surr.)	1	%	122	103
13C6-PFDA (surr.)	1	%	113	94
13C2-PFUnDA (surr.)	1	%	110	90
13C2-PFDoDA (surr.)	1	%	112	95
13C2-PFTeDA (surr.)	1	%	90	73
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05

Client Sample ID			FOT A4 SP1 TREATED 1	FOT A2 SP1 TREATED 1
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0013102	B22-No0013103
Date Sampled			Nov 04, 2022	Nov 04, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	131	113
D3-N-MeFOSA (surr.)	1	%	112	104
D5-N-EtFOSA (surr.)	1	%	107	101
D7-N-MeFOSE (surr.)	1	%	94	77
D9-N-EtFOSE (surr.)	1	%	93	69
D5-N-EtFOSAA (surr.)	1	%	106	94
D3-N-MeFOSAA (surr.)	1	%	100	90
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.01	[N09]0.05
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	140	115
18O2-PFHxS (surr.)	1	%	118	97
13C8-PFOS (surr.)	1	%	119	104
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	102	94
13C2-6:2 FTSA (surr.)	1	%	113	89
13C2-8:2 FTSA (surr.)	1	%	95	83
13C2-10:2 FTSA (surr.)	1	%	112	94
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	0.01	0.05
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.01	0.05
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.01	0.05
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Nov 07, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 938297
Phone: 0438 334 813
Fax:

Received: Nov 7, 2022 9:00 AM
Due: Nov 8, 2022
Priority: 1 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A4 SP1 TREATED 1	Nov 04, 2022		AUS Leachate - Reagent Water	B22-No0013102	X	X
2	FOT A2 SP1 TREATED 1	Nov 04, 2022		AUS Leachate - Reagent Water	B22-No0013103	X	X
3	TRIP BLANK	Not Provided		Water	B22-No0013104		X
Test Counts						2	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0013103	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0013103	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0013103	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0013103	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0013103	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0013103	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0013103	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0013103	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0013103	CP	ug/L	0.05	0.04	11	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0013103	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0013103	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

James McCann	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
1392 Kingsford Smith Drive
Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Jack Vahtera**

Report **938297-W**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 07, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-No0013104**
Date Sampled			**Not Provided**[I12]
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	113
13C5-PFPeA (surr.)	1	%	100
13C5-PFHxA (surr.)	1	%	120
13C4-PFHpA (surr.)	1	%	87
13C8-PFOA (surr.)	1	%	83
13C5-PFNA (surr.)	1	%	99
13C6-PFDA (surr.)	1	%	100
13C2-PFUnDA (surr.)	1	%	111
13C2-PFDoDA (surr.)	1	%	148
13C2-PFTeDA (surr.)	1	%	97
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	84
D3-N-MeFOSA (surr.)	1	%	123

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-No0013104
Date Sampled			Not Provided[I12]
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	152
D7-N-MeFOSE (surr.)	1	%	90
D9-N-EtFOSE (surr.)	1	%	87
D5-N-EtFOSAA (surr.)	1	%	99
D3-N-MeFOSAA (surr.)	1	%	92
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	128
18O2-PFHxS (surr.)	1	%	143
13C8-PFOS (surr.)	1	%	125
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	96
13C2-6:2 FTSA (surr.)	1	%	101
13C2-8:2 FTSA (surr.)	1	%	101
13C2-10:2 FTSA (surr.)	1	%	108
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 938297
Phone: 0438 334 813
Fax:

Received: Nov 7, 2022 9:00 AM
Due: Nov 8, 2022
Priority: 1 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A4 SP1 TREATED 1	Nov 04, 2022		AUS Leachate - Reagent Water	B22-No0013102	X	X
2	FOT A2 SP1 TREATED 1	Nov 04, 2022		AUS Leachate - Reagent Water	B22-No0013103	X	X
3	TRIP BLANK	Not Provided		Water	B22-No0013104		X
Test Counts						2	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	82			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	82			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	84			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	87			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	89			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	95			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	77			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	94			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	84			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	73			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	93			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	78			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	90			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	69			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	115			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	81			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	86			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	79			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	86			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	76			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	101			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	81			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	88			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	74			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	89			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	75			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	76			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	96			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	S22-No0009636	NCP	%	84			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S22-No0009636	NCP	%	85			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S22-No0009636	NCP	%	83			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-No0009636	NCP	%	90			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S22-No0009636	NCP	%	95			50-150	Pass	
Perfluorononanoic acid (PFNA)	S22-No0009636	NCP	%	92			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S22-No0009636	NCP	%	76			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-No0009636	NCP	%	84			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S22-No0009636	NCP	%	88			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-No0009636	NCP	%	66			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-No0009636	NCP	%	93			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	S22-No0009636	NCP	%	80			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-No0009636	NCP	%	86			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-No0009636	NCP	%	74			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-No0009636	NCP	%	115			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-No0009636	NCP	%	82			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-No0009636	NCP	%	83			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-No0009636	NCP	%	78			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S22-No0009636	NCP	%	80			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-No0009636	NCP	%	74			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-No0009636	NCP	%	88			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-No0009636	NCP	%	69			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-No0009636	NCP	%	85			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-No0009636	NCP	%	73			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-No0009636	NCP	%	88			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-No0009636	NCP	%	72			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-No0009636	NCP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-No0009636	NCP	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-No0009636	NCP	%	82			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-No0009636	NCP	%	90			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0013104	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0013104	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0013104	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0013104	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0013104	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0013104	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0013104	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0013104	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0013104	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0013104	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
I12	Where sampling date has not been provided, Eurofins | Environment Testing is not able to determine whether analysis has been performed within recommended holding times.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

James McCann	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **939125-L-V2**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 09, 2022

Client Sample ID			**FOT A3 SP6 TREATED 4**	**FOT A3 SP6 TREATED 5**	**FOT Area 3 SP6 Treated 5 Dup**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-No0019229**	**B22-No0019230**	**B22-No0019231**
Date Sampled			**Nov 08, 2022**	**Nov 08, 2022**	**Nov 08, 2022**
Test/Reference	LOR	Unit			
AUS Leaching Procedure					
Leachate Fluid[C01]		comment	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.1	9.2	9.2
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	94	99	96
13C5-PFPeA (surr.)	1	%	122	124	120
13C5-PFHxA (surr.)	1	%	102	108	100
13C4-PFHpA (surr.)	1	%	116	109	106
13C8-PFOA (surr.)	1	%	106	107	107
13C5-PFNA (surr.)	1	%	113	118	110
13C6-PFDA (surr.)	1	%	111	104	99
13C2-PFUnDA (surr.)	1	%	91	83	91
13C2-PFDoDA (surr.)	1	%	110	97	103
13C2-PFTeDA (surr.)	1	%	97	79	100

Client Sample ID			FOT A3 SP6 TREATED 4	FOT A3 SP6 TREATED 5	FOT Area 3 SP6 Treated 5 Dup
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0019229	B22-No0019230	B22-No0019231
Date Sampled			Nov 08, 2022	Nov 08, 2022	Nov 08, 2022
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	116	110	109
D3-N-MeFOSA (surr.)	1	%	137	126	129
D5-N-EtFOSA (surr.)	1	%	119	114	108
D7-N-MeFOSE (surr.)	1	%	75	71	68
D9-N-EtFOSE (surr.)	1	%	69	62	64
D5-N-EtFOSAA (surr.)	1	%	114	116	120
D3-N-MeFOSAA (surr.)	1	%	81	84	78
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.02	[N09]0.02	[N09]0.02
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	118	108	107
18O2-PFHxS (surr.)	1	%	113	112	116
13C8-PFOS (surr.)	1	%	115	102	109
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	92	110	99
13C2-6:2 FTSA (surr.)	1	%	128	143	134
13C2-8:2 FTSA (surr.)	1	%	125	142	120
13C2-10:2 FTSA (surr.)	1	%	120	108	113
PFASs Summations					
Sum (PFHxS + PFOS)*	0.01	ug/L	0.02	0.02	0.02
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.02	0.02	0.02
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.02	0.02	0.02
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Nov 09, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 09, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 09, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 09, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 09, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 939125
Phone: (07) 3637 2900
Fax:

Received: Nov 9, 2022 9:01 AM
Due: Nov 10, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A3 SP6 TREATED 4	Nov 08, 2022		AUS Leachate - Reagent Water	B22-No0019229	X	X
2	FOT A3 SP6 TREATED 5	Nov 08, 2022		AUS Leachate - Reagent Water	B22-No0019230	X	X
3	FOT Area 3 SP6 Treated 5 Dup	Nov 08, 2022		AUS Leachate - Reagent Water	B22-No0019231	X	X
4	TRIP BLANK	Nov 08, 2022		Water	B22-No0019232		X
Test Counts						3	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0019230	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0019230	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0019230	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0019230	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0019230	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0019230	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0019230	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0019230	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0019230	CP	ug/L	0.02	0.02	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0019230	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0019230	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

This report has been revised (V2) to correct sample name FOT Area 3 SP6 Treated 6 to FOT Area 3 SP6 Treated 5 Dup.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

James McCann	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
1392 Kingsford Smith Drive
Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **939125-W**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 09, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-No0019232**
Date Sampled			**Nov 08, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	140
13C5-PFPeA (surr.)	1	%	97
13C5-PFHxA (surr.)	1	%	90
13C4-PFHpA (surr.)	1	%	99
13C8-PFOA (surr.)	1	%	101
13C5-PFNA (surr.)	1	%	92
13C6-PFDA (surr.)	1	%	105
13C2-PFUnDA (surr.)	1	%	107
13C2-PFDoDA (surr.)	1	%	112
13C2-PFTeDA (surr.)	1	%	96
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	81
D3-N-MeFOSA (surr.)	1	%	81

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-No0019232
Date Sampled			Nov 08, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	85
D7-N-MeFOSE (surr.)	1	%	98
D9-N-EtFOSE (surr.)	1	%	98
D5-N-EtFOSAA (surr.)	1	%	120
D3-N-MeFOSAA (surr.)	1	%	86
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	139
18O2-PFHxS (surr.)	1	%	109
13C8-PFOS (surr.)	1	%	124
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	102
13C2-6:2 FTSA (surr.)	1	%	101
13C2-8:2 FTSA (surr.)	1	%	136
13C2-10:2 FTSA (surr.)	1	%	108
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 09, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 09, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 09, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 09, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 939125
Phone: (07) 3637 2900
Fax:

Received: Nov 9, 2022 9:01 AM
Due: Nov 10, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A3 SP6 TREATED 4	Nov 08, 2022		AUS Leachate - Reagent Water	B22-No0019229	X	X
2	FOT A3 SP6 TREATED 5	Nov 08, 2022		AUS Leachate - Reagent Water	B22-No0019230	X	X
3	FOT A3 SP6 TREATED 6	Nov 08, 2022		AUS Leachate - Reagent Water	B22-No0019231	X	X
4	TRIP BLANK	Nov 08, 2022		Water	B22-No0019232		X
Test Counts						3	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	85			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	81			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	80			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	80			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	71			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	83			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	72			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	76			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	79			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	83			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	77			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	69			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	75			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	60			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	90			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	87			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	93			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	102			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	74			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	79			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	113			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	76			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	87			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	109			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	85			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	50			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	70			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	115			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	77			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	S22-No0011943	NCP	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S22-No0011943	NCP	%	113			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S22-No0011943	NCP	%	100			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-No0011943	NCP	%	84			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S22-No0011943	NCP	%	78			50-150	Pass	
Perfluorononanoic acid (PFNA)	S22-No0011943	NCP	%	81			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S22-No0011943	NCP	%	84			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-No0011943	NCP	%	102			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S22-No0011943	NCP	%	104			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-No0011943	NCP	%	134			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-No0011943	NCP	%	99			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	S22-No0011943	NCP	%	81			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-No0011943	NCP	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-No0011943	NCP	%	63			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-No0011943	NCP	%	117			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-No0011943	NCP	%	98			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-No0011943	NCP	%	109			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-No0011943	NCP	%	122			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S22-No0011943	NCP	%	84			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-No0011943	NCP	%	82			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-No0011943	NCP	%	112			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-No0011943	NCP	%	94			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-No0011943	NCP	%	117			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-No0011943	NCP	%	126			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-No0011943	NCP	%	84			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-No0011943	NCP	%	55			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-No0011943	NCP	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-No0011943	NCP	%	84			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-No0011943	NCP	%	150			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-No0011943	NCP	%	83			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S22-No0011467	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S22-No0011467	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-No0011467	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-No0011467	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-No0011467	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-No0011467	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-No0011467	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-No0011467	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-No0011467	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-No0011467	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
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Accreditation Number 1261
Site Number 20794

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Attention: **Quentin Xu**

Report **940110-L**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 11, 2022

Client Sample ID			**FOT A3 SP5 TREATED 1**	**FOT A3 SP5 TREATED 2**	**FOT A3 SP5 TREATED 3**	**FOT A3 SP5 TREATED 4**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-No0027214**	**B22-No0027215**	**B22-No0027216**	**B22-No0027217**
Date Sampled			**Nov 09, 2022**	**Nov 09, 2022**	**Nov 09, 2022**	**Nov 09, 2022**
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.1	9.0	9.1	9.1
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	58	56	59	67
13C5-PFPeA (surr.)	1	%	78	71	83	86
13C5-PFHxA (surr.)	1	%	71	68	73	82
13C4-PFHpA (surr.)	1	%	78	75	76	93
13C8-PFOA (surr.)	1	%	83	77	83	93
13C5-PFNA (surr.)	1	%	93	80	86	90
13C6-PFDA (surr.)	1	%	88	76	89	90
13C2-PFUnDA (surr.)	1	%	77	63	81	75
13C2-PFDoDA (surr.)	1	%	74	57	77	67
13C2-PFTeDA (surr.)	1	%	69	58	75	54
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			FOT A3 SP5 TREATED 1	FOT A3 SP5 TREATED 2	FOT A3 SP5 TREATED 3	FOT A3 SP5 TREATED 4
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0027214	B22-No0027215	B22-No0027216	B22-No0027217
Date Sampled			Nov 09, 2022	Nov 09, 2022	Nov 09, 2022	Nov 09, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	105	91	108	102
D3-N-MeFOSA (surr.)	1	%	128	95	125	109
D5-N-EtFOSA (surr.)	1	%	143	110	152	120
D7-N-MeFOSE (surr.)	1	%	69	48	68	51
D9-N-EtFOSE (surr.)	1	%	71	50	69	56
D5-N-EtFOSAA (surr.)	1	%	71	52	75	66
D3-N-MeFOSAA (surr.)	1	%	66	48	69	61
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.02	[N09]0.04	[N09]0.02	[N09]0.03
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	85	81	92	93
18O2-PFHxS (surr.)	1	%	92	91	93	101
13C8-PFOS (surr.)	1	%	93	74	92	87
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	59	58	53	63
13C2-6:2 FTSA (surr.)	1	%	64	59	69	76
13C2-8:2 FTSA (surr.)	1	%	75	64	74	76
13C2-10:2 FTSA (surr.)	1	%	79	63	86	73
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.02	0.04	0.02	0.03
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.02	0.04	0.02	0.03
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.02	0.04	0.02	0.03
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Nov 11, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 940110
Phone: (07) 3637 2900
Fax:

Received: Nov 11, 2022 9:35 AM
Due: Nov 14, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A3 SP5 TREATED 1	Nov 09, 2022		AUS Leachate - Reagent Water	B22-No0027214	X	X
2	FOT A3 SP5 TREATED 2	Nov 09, 2022		AUS Leachate - Reagent Water	B22-No0027215	X	X
3	FOT A3 SP5 TREATED 3	Nov 09, 2022		AUS Leachate - Reagent Water	B22-No0027216	X	X
4	FOT A3 SP5 TREATED 4	Nov 09, 2022		AUS Leachate - Reagent Water	B22-No0027217	X	X
5	TRIP BLANK	Nov 09, 2022		Water	B22-No0027218		X
Test Counts						4	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0027214	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0027214	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0027214	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0027214	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0027214	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0027214	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0027214	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0027214	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0027214	CP	ug/L	0.02	0.02	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0027214	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0027214	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **940110-W**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 11, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-No0027218**
Date Sampled			**Nov 09, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	127
13C5-PFPeA (surr.)	1	%	147
13C5-PFHxA (surr.)	1	%	110
13C4-PFHpA (surr.)	1	%	130
13C8-PFOA (surr.)	1	%	122
13C5-PFNA (surr.)	1	%	140
13C6-PFDA (surr.)	1	%	120
13C2-PFUnDA (surr.)	1	%	136
13C2-PFDoDA (surr.)	1	%	121
13C2-PFTeDA (surr.)	1	%	57
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	75
D3-N-MeFOSA (surr.)	1	%	67

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-No0027218
Date Sampled			Nov 09, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	66
D7-N-MeFOSE (surr.)	1	%	42
D9-N-EtFOSE (surr.)	1	%	122
D5-N-EtFOSAA (surr.)	1	%	86
D3-N-MeFOSAA (surr.)	1	%	89
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	126
18O2-PFHxS (surr.)	1	%	117
13C8-PFOS (surr.)	1	%	135
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	168
13C2-6:2 FTSA (surr.)	1	%	113
13C2-8:2 FTSA (surr.)	1	%	78
13C2-10:2 FTSA (surr.)	1	%	97
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 940110
Phone: (07) 3637 2900
Fax:

Received: Nov 11, 2022 9:35 AM
Due: Nov 14, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A3 SP5 TREATED 1	Nov 09, 2022		AUS Leachate - Reagent Water	B22-No0027214	X	X
2	FOT A3 SP5 TREATED 2	Nov 09, 2022		AUS Leachate - Reagent Water	B22-No0027215	X	X
3	FOT A3 SP5 TREATED 3	Nov 09, 2022		AUS Leachate - Reagent Water	B22-No0027216	X	X
4	FOT A3 SP5 TREATED 4	Nov 09, 2022		AUS Leachate - Reagent Water	B22-No0027217	X	X
5	TRIP BLANK	Nov 09, 2022		Water	B22-No0027218		X
Test Counts						4	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	86			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	84			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	86			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	92			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	89			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	74			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	87			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	83			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	90			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	78			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	80			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	91			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	73			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	73			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	77			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	81			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	82			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	78			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	74			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	92			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	76			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	83			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	73			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	86			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	52			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	86			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	95			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B22-No0027020	NCP	%	84			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0027020	NCP	%	89			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0027020	NCP	%	86			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0027020	NCP	%	94			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0027020	NCP	%	91			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-No0027020	NCP	%	92			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0027020	NCP	%	71			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0027020	NCP	%	105			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0027020	NCP	%	89			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0027020	NCP	%	50			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0027020	NCP	%	86			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-No0027020	NCP	%	85			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0027020	NCP	%	83			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0027020	NCP	%	75			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0027020	NCP	%	84			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0027020	NCP	%	79			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0027020	NCP	%	84			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0027020	NCP	%	89			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-No0027020	NCP	%	85			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0027020	NCP	%	65			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0027020	NCP	%	85			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0027020	NCP	%	85			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0027020	NCP	%	87			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0027020	NCP	%	84			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0027020	NCP	%	87			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0027020	NCP	%	51			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0027020	NCP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0027020	NCP	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0027020	NCP	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0027020	NCP	%	97			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0027019	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0027019	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0027019	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0027019	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0027019	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0027019	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0027019	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0027019	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0027019	NCP	ug/L	0.02	0.02	3.5	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0027019	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0027019	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Sarah McCallion	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Jack Vahtera**

Report **940378-L**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 11, 2022

Client Sample ID			**FOT A3 SP2 TREATED 2**	**FOT A3 SP1 TREATED 1**	**FOT A3 SP1 TREATED 2**	**FOT A3 SP1 TREATED 3**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-No0028911**	**B22-No0028912**	**B22-No0028913**	**B22-No0028914**
Date Sampled			**Nov 10, 2022**	**Nov 10, 2022**	**Nov 10, 2022**	**Nov 10, 2022**
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.1	9.1	9.0	9.1
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	118	112	115	112
13C5-PFPeA (surr.)	1	%	110	101	108	108
13C5-PFHxA (surr.)	1	%	108	104	106	110
13C4-PFHpA (surr.)	1	%	125	119	123	120
13C8-PFOA (surr.)	1	%	129	121	124	127
13C5-PFNA (surr.)	1	%	128	131	129	124
13C6-PFDA (surr.)	1	%	117	124	122	117
13C2-PFUnDA (surr.)	1	%	119	122	120	112
13C2-PFDoDA (surr.)	1	%	88	90	86	81
13C2-PFTeDA (surr.)	1	%	72	79	76	61
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			FOT A3 SP2 TREATED 2	FOT A3 SP1 TREATED 1	FOT A3 SP1 TREATED 2	FOT A3 SP1 TREATED 3
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-No0028911**	**B22-No0028912**	**B22-No0028913**	**B22-No0028914**
Date Sampled			**Nov 10, 2022**	**Nov 10, 2022**	**Nov 10, 2022**	**Nov 10, 2022**
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	109	105	113	108
D3-N-MeFOSA (surr.)	1	%	107	102	112	101
D5-N-EtFOSA (surr.)	1	%	96	85	96	89
D7-N-MeFOSE (surr.)	1	%	83	70	82	86
D9-N-EtFOSE (surr.)	1	%	85	78	79	86
D5-N-EtFOSAA (surr.)	1	%	75	73	73	70
D3-N-MeFOSAA (surr.)	1	%	80	80	79	78
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.01	[N09]0.03	[N09]0.03	[N09]0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	130	127	127	121
18O2-PFHxS (surr.)	1	%	102	101	105	103
13C8-PFOS (surr.)	1	%	115	118	111	112
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	127	132	119	129
13C2-6:2 FTSA (surr.)	1	%	93	94	95	91
13C2-8:2 FTSA (surr.)	1	%	INT	INT	INT	INT
13C2-10:2 FTSA (surr.)	1	%	140	142	142	128
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.01	0.03	0.03	0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.01	0.03	0.03	0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.01	0.03	0.03	0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Nov 11, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 940378
Phone: (07) 3637 2900
Fax:

Received: Nov 11, 2022 5:05 PM
Due: Nov 14, 2022
Priority: 1 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A3 SP2 TREATED 2	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0028911	X	X
2	FOT A3 SP1 TREATED 1	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0028912	X	X
3	FOT A3 SP1 TREATED 2	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0028913	X	X
4	FOT A3 SP1 TREATED 3	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0028914	X	X
5	TRIP BLANK	Nov 10, 2022		Water	B22-No0028915		X
Test Counts						4	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0028914	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0028914	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0028914	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0028914	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0028914	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0028914	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0028914	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0028914	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0028914	CP	ug/L	0.01	0.02	4.6	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0028914	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0028914	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
1392 Kingsford Smith Drive
Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Jack Vahtera**

Report **940378-W**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 11, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-No0028915**
Date Sampled			**Nov 10, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	121
13C5-PFPeA (surr.)	1	%	164
13C5-PFHxA (surr.)	1	%	161
13C4-PFHpA (surr.)	1	%	145
13C8-PFOA (surr.)	1	%	88
13C5-PFNA (surr.)	1	%	102
13C6-PFDA (surr.)	1	%	126
13C2-PFUnDA (surr.)	1	%	118
13C2-PFDoDA (surr.)	1	%	114
13C2-PFTeDA (surr.)	1	%	117
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	84
D3-N-MeFOSA (surr.)	1	%	77

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-No0028915
Date Sampled			Nov 10, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	85
D7-N-MeFOSE (surr.)	1	%	60
D9-N-EtFOSE (surr.)	1	%	57
D5-N-EtFOSAA (surr.)	1	%	97
D3-N-MeFOSAA (surr.)	1	%	97
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	128
18O2-PFHxS (surr.)	1	%	97
13C8-PFOS (surr.)	1	%	134
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	77
13C2-6:2 FTSA (surr.)	1	%	75
13C2-8:2 FTSA (surr.)	1	%	103
13C2-10:2 FTSA (surr.)	1	%	111
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 14, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 940378
Phone: (07) 3637 2900
Fax:

Received: Nov 11, 2022 5:05 PM
Due: Nov 14, 2022
Priority: 1 Day
Contact Name: Jack Vahtera

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A3 SP2 TREATED 2	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0028911	X	X
2	FOT A3 SP1 TREATED 1	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0028912	X	X
3	FOT A3 SP1 TREATED 2	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0028913	X	X
4	FOT A3 SP1 TREATED 3	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0028914	X	X
5	TRIP BLANK	Nov 10, 2022		Water	B22-No0028915		X
Test Counts						4	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	62			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	83			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	81			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	88			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	86			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	80			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	95			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	100			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	90			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	93			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	70			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	112			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	83			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	92			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	120			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	77			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	80			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	63			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	104			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	82			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	68			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	78			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	74			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	75			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	95			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	97			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B22-No0028915	CP	%	143			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0028915	CP	%	85			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0028915	CP	%	109			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0028915	CP	%	98			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0028915	CP	%	108			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-No0028915	CP	%	117			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0028915	CP	%	90			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0028915	CP	%	110			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0028915	CP	%	120			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0028915	CP	%	106			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0028915	CP	%	130			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-No0028915	CP	%	92			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0028915	CP	%	138			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0028915	CP	%	98			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0028915	CP	%	112			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0028915	CP	%	141			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0028915	CP	%	104			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0028915	CP	%	121			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-No0028915	CP	%	78			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0028915	CP	%	118			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0028915	CP	%	90			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0028915	CP	%	69			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0028915	CP	%	96			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0028915	CP	%	88			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0028915	CP	%	104			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0028915	CP	%	106			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0028915	CP	%	129			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0028915	CP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0028915	CP	%	112			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0028915	CP	%	119			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S22-No0028466	NCP	ug/L	2.2	2.4	9.9	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S22-No0028466	NCP	ug/L	0.74	0.93	23	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S22-No0028466	NCP	ug/L	1.7	1.8	6.1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-No0028466	NCP	ug/L	0.27	0.32	18	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-No0028466	NCP	ug/L	0.31	0.32	2.9	30%	Pass	
Perfluorononanoic acid (PFNA)	S22-No0028466	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S22-No0028466	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-No0028466	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S22-No0028466	NCP	ug/L	0.57	0.56	1.3	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-No0028466	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-No0028466	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-No0028466	NCP	ug/L	0.11	0.15	29	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-No0028466	NCP	ug/L	0.42	0.41	2.7	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-No0028466	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-No0028466	NCP	ug/L	0.32	0.34	5.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-No0028466	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-No0028466	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-No0028466	NCP	ug/L	2.2	2.4	12	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-No0028466	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-No0028466	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Attention: **Quentin Xu**

Report **940179-L**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 11, 2022

Client Sample ID			**FOT A3 SP4 TREATED 1**	**FOT A3 SP4 TREATED 2**	**FOT A3 SP3 TREATED 1**	**FOT A3 SP3 TREATED 2**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-No0027532**	**B22-No0027533**	**B22-No0027534**	**B22-No0027535**
Date Sampled			**Nov 10, 2022**	**Nov 10, 2022**	**Nov 10, 2022**	**Nov 10, 2022**
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.1	9.1	9.1	9.1
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	58	63	63	112
13C5-PFPeA (surr.)	1	%	80	78	85	104
13C5-PFHxA (surr.)	1	%	70	78	73	107
13C4-PFHpA (surr.)	1	%	85	84	86	115
13C8-PFOA (surr.)	1	%	84	90	90	121
13C5-PFNA (surr.)	1	%	83	90	91	117
13C6-PFDA (surr.)	1	%	94	89	89	119
13C2-PFUnDA (surr.)	1	%	81	84	81	116
13C2-PFDoDA (surr.)	1	%	77	77	73	88
13C2-PFTeDA (surr.)	1	%	71	70	72	78
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			FOT A3 SP4 TREATED 1	FOT A3 SP4 TREATED 2	FOT A3 SP3 TREATED 1	FOT A3 SP3 TREATED 2
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0027532	B22-No0027533	B22-No0027534	B22-No0027535
Date Sampled			Nov 10, 2022	Nov 10, 2022	Nov 10, 2022	Nov 10, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	102	104	108	104
D3-N-MeFOSA (surr.)	1	%	127	124	120	108
D5-N-EtFOSA (surr.)	1	%	139	148	147	97
D7-N-MeFOSE (surr.)	1	%	70	75	65	86
D9-N-EtFOSE (surr.)	1	%	73	81	70	87
D5-N-EtFOSAA (surr.)	1	%	76	80	79	69
D3-N-MeFOSAA (surr.)	1	%	65	67	72	78
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.01	[N09]0.01	[N09]0.01	[N09]0.02
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	86	87	87	124
18O2-PFHxS (surr.)	1	%	103	105	99	107
13C8-PFOS (surr.)	1	%	89	93	85	109
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	53	59	58	134
13C2-6:2 FTSA (surr.)	1	%	65	74	81	77
13C2-8:2 FTSA (surr.)	1	%	80	83	77	INT
13C2-10:2 FTSA (surr.)	1	%	78	93	82	121
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.01	0.01	0.01	0.02
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.01	0.01	0.01	0.02
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.01	0.01	0.01	0.02
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			FOT A3 SP2 TREATED 1	FOT A3 SP2 TREATED 1 DUP
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0027536	B22-No0027537
Date Sampled			Nov 10, 2022	Nov 10, 2022
Test/Reference	LOR	Unit		
AUS Leaching Procedure				
Leachate Fluid[C01]		comment	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0
pH (off)	0.1	pH Units	9.0	9.0
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	115	119
13C5-PFPeA (surr.)	1	%	108	105
13C5-PFHxA (surr.)	1	%	109	107
13C4-PFHpA (surr.)	1	%	118	118
13C8-PFOA (surr.)	1	%	125	132
13C5-PFNA (surr.)	1	%	122	128
13C6-PFDA (surr.)	1	%	117	121
13C2-PFUnDA (surr.)	1	%	112	119
13C2-PFDoDA (surr.)	1	%	82	89
13C2-PFTeDA (surr.)	1	%	63	73
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	111	109
D3-N-MeFOSA (surr.)	1	%	98	115
D5-N-EtFOSA (surr.)	1	%	90	97
D7-N-MeFOSE (surr.)	1	%	73	93
D9-N-EtFOSE (surr.)	1	%	83	101
D5-N-EtFOSAA (surr.)	1	%	70	78
D3-N-MeFOSAA (surr.)	1	%	77	81

Client Sample ID			FOT A3 SP2 TREATED 1	FOT A3 SP2 TREATED 1 DUP
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0027536	B22-No0027537
Date Sampled			Nov 10, 2022	Nov 10, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.01	[N09]0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	132	129
18O2-PFHxS (surr.)	1	%	108	107
13C8-PFOS (surr.)	1	%	113	117
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	117	134
13C2-6:2 FTSA (surr.)	1	%	85	103
13C2-8:2 FTSA (surr.)	1	%	INT	INT
13C2-10:2 FTSA (surr.)	1	%	120	140
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	0.01	0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.01	0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.01	0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Nov 11, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 940179
Phone: (07) 3637 2900
Fax:

Received: Nov 11, 2022 12:00 PM
Due: Nov 14, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A3 SP4 TREATED 1	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0027532	X	X
2	FOT A3 SP4 TREATED 2	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0027533	X	X
3	FOT A3 SP3 TREATED 1	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0027534	X	X
4	FOT A3 SP3 TREATED 2	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0027535	X	X
5	FOT A3 SP2 TREATED 1	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0027536	X	X
6	FOT A3 SP2 TREATED 1	Nov 10, 2022		AUS Leachate - Reagent	B22-No0027537	X	X

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Order No.:
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Phone: (07) 3637 2900
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Received: Nov 11, 2022 12:00 PM
Due: Nov 14, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
	DUP			Water			
7	TRIP BLANK	Nov 10, 2022		Water	B22-No0027538		X
Test Counts						6	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0027214	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0027214	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0027214	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0027214	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0027214	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0027214	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0027214	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0027214	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0027214	NCP	ug/L	0.02	0.02	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0027214	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0027214	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
1392 Kingsford Smith Drive
Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **940179-W**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 11, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-No0027538**
Date Sampled			**Nov 10, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	104
13C5-PFPeA (surr.)	1	%	157
13C5-PFHxA (surr.)	1	%	99
13C4-PFHpA (surr.)	1	%	102
13C8-PFOA (surr.)	1	%	93
13C5-PFNA (surr.)	1	%	92
13C6-PFDA (surr.)	1	%	84
13C2-PFUnDA (surr.)	1	%	91
13C2-PFDoDA (surr.)	1	%	121
13C2-PFTeDA (surr.)	1	%	125
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	74
D3-N-MeFOSA (surr.)	1	%	69

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-No0027538
Date Sampled			Nov 10, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	132
D7-N-MeFOSE (surr.)	1	%	73
D9-N-EtFOSE (surr.)	1	%	61
D5-N-EtFOSAA (surr.)	1	%	88
D3-N-MeFOSAA (surr.)	1	%	80
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	134
18O2-PFHxS (surr.)	1	%	135
13C8-PFOS (surr.)	1	%	100
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	118
13C2-6:2 FTSA (surr.)	1	%	119
13C2-8:2 FTSA (surr.)	1	%	156
13C2-10:2 FTSA (surr.)	1	%	116
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 11, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Enviropacific Services P/L (QLD)
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Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 940179
Phone: (07) 3637 2900
Fax:

Received: Nov 11, 2022 12:00 PM
Due: Nov 14, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A3 SP4 TREATED 1	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0027532	X	X
2	FOT A3 SP4 TREATED 2	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0027533	X	X
3	FOT A3 SP3 TREATED 1	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0027534	X	X
4	FOT A3 SP3 TREATED 2	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0027535	X	X
5	FOT A3 SP2 TREATED 1	Nov 10, 2022		AUS Leachate - Reagent Water	B22-No0027536	X	X
6	FOT A3 SP2 TREATED 1	Nov 10, 2022		AUS Leachate - Reagent	B22-No0027537	X	X

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QLD 4008

Project Name: CSS PFAS SOIL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 940179
Phone: (07) 3637 2900
Fax:

Received: Nov 11, 2022 12:00 PM
Due: Nov 14, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
	DUP			Water			
7	TRIP BLANK	Nov 10, 2022		Water	B22-No0027538		X
Test Counts						6	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	88			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	85			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	91			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	86			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	98			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	97			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	90			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	92			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	91			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	107			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	90			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	91			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	97			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	82			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	86			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	105			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	91			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	79			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	79			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	100			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	69			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	86			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	68			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	86			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	116			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B22-No0008925	NCP	%	90			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0008925	NCP	%	88			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0008925	NCP	%	89			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0008925	NCP	%	89			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0008925	NCP	%	93			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-No0008925	NCP	%	95			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0008925	NCP	%	87			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0008925	NCP	%	85			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0008925	NCP	%	89			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0008925	NCP	%	100			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0008925	NCP	%	94			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-No0008925	NCP	%	89			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0008925	NCP	%	91			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0008925	NCP	%	89			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0008925	NCP	%	85			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0008925	NCP	%	101			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0008925	NCP	%	94			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0008925	NCP	%	91			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-No0008925	NCP	%	77			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0008925	NCP	%	82			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0008925	NCP	%	77			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0008925	NCP	%	68			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0008925	NCP	%	93			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0008925	NCP	%	76			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0008925	NCP	%	92			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0008925	NCP	%	79			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0008925	NCP	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0008925	NCP	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0008925	NCP	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0008925	NCP	%	98			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0027538	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0027538	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0027538	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0027538	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0027538	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0027538	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0027538	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0027538	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0027538	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0027538	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Sarah McCallion	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **941501-L**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 16, 2022

Client Sample ID			**FOT A4 SP1 TREATED DUP 1**
Sample Matrix			**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-No0037601**
Date Sampled			**Nov 15, 2022**
Test/Reference	LOR	Unit	
AUS Leaching Procedure			
Leachate Fluid[C01]		comment	4
pH (initial)	0.1	pH Units	n/a
pH (Leachate fluid)	0.1	pH Units	7.0
pH (off)	0.1	pH Units	8.5
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.02
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	108
13C5-PFPeA (surr.)	1	%	87
13C5-PFHxA (surr.)	1	%	119
13C4-PFHpA (surr.)	1	%	119
13C8-PFOA (surr.)	1	%	97
13C5-PFNA (surr.)	1	%	98
13C6-PFDA (surr.)	1	%	102
13C2-PFUnDA (surr.)	1	%	99
13C2-PFDoDA (surr.)	1	%	85
13C2-PFTeDA (surr.)	1	%	76

Client Sample ID			FOT A4 SP1 TREATED DUP 1
Sample Matrix			AUS Leachate - Reagent Water
Eurofins Sample No.			B22-No0037601
Date Sampled			Nov 15, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	117
D3-N-MeFOSA (surr.)	1	%	122
D5-N-EtFOSA (surr.)	1	%	104
D7-N-MeFOSE (surr.)	1	%	70
D9-N-EtFOSE (surr.)	1	%	70
D5-N-EtFOSAA (surr.)	1	%	89
D3-N-MeFOSAA (surr.)	1	%	93
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	108
18O2-PFHxS (surr.)	1	%	135
13C8-PFOS (surr.)	1	%	116
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	124
13C2-6:2 FTSA (surr.)	1	%	121
13C2-8:2 FTSA (surr.)	1	%	116
13C2-10:2 FTSA (surr.)	1	%	91
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Nov 16, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Address: 1392 Kingsford Smith Drive
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Project Name: CSS PFAS SOL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 941501
Phone: (07) 3637 2900
Fax:

Received: Nov 16, 2022 9:35 AM
Due: Nov 17, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						HOLD	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	FOT A4 SP1 TREATED DUP 1	Nov 15, 2022		AUS Leachate - Reagent Water	B22-No0037601		X	X
2	TRIP BLANK	Nov 15, 2022		Water	B22-No0037602			X
3	FOT A4 SP1 TREATED DUP 2	Nov 15, 2022		Soil	B22-No0037603	X		
Test Counts						1	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S22-No0034842	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S22-No0034842	NCP	ug/L	0.02	0.02	10	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S22-No0034842	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-No0034842	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-No0034842	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-No0034842	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-No0034842	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-No0034842	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-No0034842	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-No0034842	NCP	ug/L	0.08	0.09	15	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-No0034842	NCP	ug/L	0.22	0.25	11	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-No0034842	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-No0034842	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Bonnie Pu	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Enviropacific Services P/L (QLD)
1392 Kingsford Smith Drive
Pinkenba
QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **941501-W**
Project name CSS PFAS SOIL TREATMENT TRIAL
Project ID 107223
Received Date Nov 16, 2022

Client Sample ID			**TRIP BLANK**
Sample Matrix			**Water**
Eurofins Sample No.			**B22-No0037602**
Date Sampled			**Nov 15, 2022**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	93
13C5-PFPeA (surr.)	1	%	79
13C5-PFHxA (surr.)	1	%	75
13C4-PFHpA (surr.)	1	%	91
13C8-PFOA (surr.)	1	%	88
13C5-PFNA (surr.)	1	%	82
13C6-PFDA (surr.)	1	%	91
13C2-PFUnDA (surr.)	1	%	85
13C2-PFDoDA (surr.)	1	%	86
13C2-PFTeDA (surr.)	1	%	75
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	92
D3-N-MeFOSA (surr.)	1	%	58

Client Sample ID			TRIP BLANK
Sample Matrix			Water
Eurofins Sample No.			B22-No0037602
Date Sampled			Nov 15, 2022
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D5-N-EtFOSA (surr.)	1	%	70
D7-N-MeFOSE (surr.)	1	%	66
D9-N-EtFOSE (surr.)	1	%	67
D5-N-EtFOSAA (surr.)	1	%	79
D3-N-MeFOSAA (surr.)	1	%	85
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	111
18O2-PFHxS (surr.)	1	%	87
13C8-PFOS (surr.)	1	%	86
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	86
13C2-6:2 FTSA (surr.)	1	%	79
13C2-8:2 FTSA (surr.)	1	%	93
13C2-10:2 FTSA (surr.)	1	%	90
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 16, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CSS PFAS SOL TREATMENT TRIAL
Project ID: 107223

Order No.:
Report #: 941501
Phone: (07) 3637 2900
Fax:

Received: Nov 16, 2022 9:35 AM
Due: Nov 17, 2022
Priority: 1 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : James McCann

Sample Detail						HOLD	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	FOT A4 SP1 TREATED DUP 1	Nov 15, 2022		AUS Leachate - Reagent Water	B22-No0037601		X	X
2	TRIP BLANK	Nov 15, 2022		Water	B22-No0037602			X
3	FOT A4 SP1 TREATED DUP 2	Nov 15, 2022		Soil	B22-No0037603	X		
Test Counts						1	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	118			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	114			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	87			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	105			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	116			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	92			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	104			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	110			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	126			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	116			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	94			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	116			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	74			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	110			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	119			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	120			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	125			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	73			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	97			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	98			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	74			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	93			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	95			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	97			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	88			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	126			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	124			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	124			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B22-No0037602	CP	%	117			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0037602	CP	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0037602	CP	%	114			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0037602	CP	%	86			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0037602	CP	%	99			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-No0037602	CP	%	116			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0037602	CP	%	94			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0037602	CP	%	106			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0037602	CP	%	112			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0037602	CP	%	127			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0037602	CP	%	121			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-No0037602	CP	%	100			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0037602	CP	%	130			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0037602	CP	%	96			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0037602	CP	%	124			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0037602	CP	%	138			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0037602	CP	%	123			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0037602	CP	%	125			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-No0037602	CP	%	76			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0037602	CP	%	104			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0037602	CP	%	87			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0037602	CP	%	76			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0037602	CP	%	95			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0037602	CP	%	94			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0037602	CP	%	100			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0037602	CP	%	98			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0037602	CP	%	125			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0037602	CP	%	108			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0037602	CP	%	119			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0037602	CP	%	121			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S22-No0032980	NCP	ug/L	1.6	1.7	2.5	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S22-No0032980	NCP	ug/L	0.87	0.92	19	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S22-No0032980	NCP	ug/L	1.3	1.5	13	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S22-No0032980	NCP	ug/L	0.21	0.19	9.8	30%	Pass	
Perfluorooctanoic acid (PFOA)	S22-No0032980	NCP	ug/L	0.19	0.21	9.2	30%	Pass	
Perfluorononanoic acid (PFNA)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S22-No0032980	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S22-No0032980	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S22-No0032980	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S22-No0032980	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S22-No0032980	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S22-No0032980	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S22-No0032980	NCP	ug/L	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S22-No0032980	NCP	ug/L	0.58	0.56	2.9	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S22-No0032980	NCP	ug/L	0.12	0.13	8.7	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S22-No0032980	NCP	ug/L	0.32	0.35	9.2	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S22-No0032980	NCP	ug/L	0.11	0.14	18	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S22-No0032980	NCP	ug/L	0.73	0.77	5.9	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S22-No0032980	NCP	ug/L	< 0.1	< 0.1	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Bonnie Pu	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Accreditation Number 1261
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Attention: **Quentin Xu**

Report **1018622-L**
Project name CS ENERGY CALLIDE POWER PLANT
Project ID 107259
Received Date Aug 21, 2023

Client Sample ID			**FTGSP1_180823**	**FTGSP1_2_180823**
Sample Matrix			**AUS Leachate**	**AUS Leachate**
Eurofins Sample No.			**B23-Au0050879**	**B23-Au0050880**
Date Sampled			**Aug 18, 2023**	**Aug 18, 2023**
Test/Reference	LOR	Unit		
AUS Leaching Procedure				
Leachate Fluid[C01]		comment	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0
pH (off)	0.1	pH Units	9.3	9.4
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.06	0.07
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.08	0.06
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	[N09]0.27	[N09]0.20
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.05	[N09]0.03
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.12	[N09]0.08
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	48	15
13C5-PFPeA (surr.)	1	%	116	101
13C5-PFHxA (surr.)	1	%	87	88
13C4-PFHpA (surr.)	1	%	104	107
13C8-PFOA (surr.)	1	%	104	116
13C5-PFNA (surr.)	1	%	91	94
13C6-PFDA (surr.)	1	%	92	90
13C2-PFUnDA (surr.)	1	%	102	94
13C2-PFDoDA (surr.)	1	%	86	90
13C2-PFTeDA (surr.)	1	%	63	68
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05

Client Sample ID			FTGSP1_180823	FTGSP1_2_180823
Sample Matrix			AUS Leachate	AUS Leachate
Eurofins Sample No.			B23-Au0050879	B23-Au0050880
Date Sampled			Aug 18, 2023	Aug 18, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	91	96
D3-N-MeFOSA (surr.)	1	%	68	92
D5-N-EtFOSA (surr.)	1	%	71	87
D7-N-MeFOSE (surr.)	1	%	70	72
D9-N-EtFOSE (surr.)	1	%	70	78
D5-N-EtFOSAA (surr.)	1	%	105	95
D3-N-MeFOSAA (surr.)	1	%	83	88
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.07	0.05
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	0.03	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.02	0.02
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.05	[N09]0.03
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.34	[N09]0.19
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.05	[N09]0.03
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]3.2	[N09]1.7
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	103	113
18O2-PFHxS (surr.)	1	%	99	104
13C8-PFOS (surr.)	1	%	83	87
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	0.37	0.19
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	0.07	0.06
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	125	122
13C2-6:2 FTSA (surr.)	1	%	101	107
13C2-8:2 FTSA (surr.)	1	%	99	100
13C2-10:2 FTSA (surr.)	1	%	97	112
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	3.54	1.89
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	3.32	1.78
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	3.66	1.97
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	4.63	2.63
Sum of PFASs (n=30)*	0.1	ug/L	4.79	2.71

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Aug 21, 2023	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Aug 21, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Aug 21, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Aug 21, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Aug 21, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CS ENERGY CALLIDE POWER PLANT
Project ID: 107259

Order No.: N/A
Report #: 1018622
Phone: (07) 3637 2900
Fax:

Received: Aug 21, 2023 9:30 AM
Due: Aug 24, 2023
Priority: 3 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						HOLD	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	FTGSP1_180823	Aug 18, 2023		AUS Leachate	B23-Au0050879		X	X
2	FTGSP1_2_180823	Aug 18, 2023		AUS Leachate	B23-Au0050880		X	X
3	TRIP BLANK	Aug 18, 2023		Trip Blank (liquid)	B23-Au0050881	X		
Test Counts						1	2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Au0050879	CP	ug/L	0.06	0.08	18	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Au0050879	CP	ug/L	0.08	0.07	11	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Au0050879	CP	ug/L	0.27	0.24	11	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Au0050879	CP	ug/L	0.05	0.05	2.6	30%	Pass	
Perfluorooctanoic acid (PFOA)	B23-Au0050879	CP	ug/L	0.12	0.12	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Au0050879	CP	ug/L	0.01	0.01	3.3	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Au0050879	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Au0050879	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B23-Au0050879	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Au0050879	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Au0050879	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B23-Au0050879	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Au0050879	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Au0050879	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Au0050879	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Au0050879	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Au0050879	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Au0050879	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Au0050879	CP	ug/L	0.07	0.06	15	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Au0050879	CP	ug/L	0.03	0.03	1.1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Au0050879	CP	ug/L	0.02	0.02	6.2	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Au0050879	CP	ug/L	0.05	0.05	11	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Au0050879	CP	ug/L	0.34	0.37	8.1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Au0050879	CP	ug/L	0.05	0.05	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Au0050879	CP	ug/L	3.2	3.4	6.4	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Au0050879	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Au0050879	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Au0050879	CP	ug/L	0.37	0.35	4.6	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Au0050879	CP	ug/L	0.07	0.07	1.4	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Au0050879	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Zoe Flynn	Analytical Services Manager
Jonathon Angell	Senior Analyst-Sample Properties
Sarah McCallion	Senior Analyst-PFAS



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **1019732-L**
Project name CS ENERGY CALLIDE POWER PLANT
Project ID 107259
Received Date Aug 24, 2023

Client Sample ID			**FTGSP2_230823**
Sample Matrix			**AUS Leachate**
Eurofins Sample No.			**B23-Au0060683**
Date Sampled			**Aug 23, 2023**
Test/Reference	LOR	Unit	
AUS Leaching Procedure			
Leachate Fluid[C01]		comment	4.0
pH (initial)	0.1	pH Units	N/A
pH (Leachate fluid)	0.1	pH Units	7.0
pH (off)	0.1	pH Units	9.3
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.06
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.13
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.28
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	0.09
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	0.18
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	16
13C5-PFPeA (surr.)	1	%	47
13C5-PFHxA (surr.)	1	%	66
13C4-PFHpA (surr.)	1	%	66
13C8-PFOA (surr.)	1	%	80
13C5-PFNA (surr.)	1	%	71
13C6-PFDA (surr.)	1	%	91
13C2-PFUnDA (surr.)	1	%	75
13C2-PFDoDA (surr.)	1	%	111
13C2-PFTeDA (surr.)	1	%	79
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05

Client Sample ID			FTGSP2_230823
Sample Matrix			**AUS Leachate**
Eurofins Sample No.			**B23-Au0060683**
Date Sampled			**Aug 23, 2023**
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	103
D3-N-MeFOSA (surr.)	1	%	37
D5-N-EtFOSA (surr.)	1	%	33
D7-N-MeFOSE (surr.)	1	%	INT
D9-N-EtFOSE (surr.)	1	%	INT
D5-N-EtFOSAA (surr.)	1	%	82
D3-N-MeFOSAA (surr.)	1	%	74
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.07
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.02
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	0.06
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]0.43
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.05
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]2.1
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	83
18O2-PFHxS (surr.)	1	%	81
13C8-PFOS (surr.)	1	%	101
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	1.1
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	0.09
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	67
13C2-6:2 FTSA (surr.)	1	%	58
13C2-8:2 FTSA (surr.)	1	%	69
13C2-10:2 FTSA (surr.)	1	%	105
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	2.53
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	2.28
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	2.71
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	4.53
Sum of PFASs (n=30)*	0.1	ug/L	4.67

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Aug 24, 2023	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Aug 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Aug 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Aug 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Aug 24, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CS ENERGY CALLIDE POWER PLANT
Project ID: 107259

Order No.: N/A
Report #: 1019732
Phone: (07) 3637 2900
Fax:

Received: Aug 24, 2023 9:30 AM
Due: Aug 31, 2023
Priority: 5 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						HOLD	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	FTGSP2_230823	Aug 23, 2023		AUS Leachate	B23-Au0060683		X	X
2	TRIP BLANK	Aug 18, 2023		Trip Blank (liquid)	B23-Au0060684	X		
Test Counts						1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	TW23-Au0056639	NCP	ug/L	0.23	0.22	5.2	30%	Pass	
Perfluoropentanoic acid (PFPeA)	TW23-Au0056639	NCP	ug/L	0.17	0.15	11	30%	Pass	
Perfluorohexanoic acid (PFHxA)	TW23-Au0056639	NCP	ug/L	0.25	0.27	9.7	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	TW23-Au0056639	NCP	ug/L	0.02	0.02	3.3	30%	Pass	
Perfluorooctanoic acid (PFOA)	TW23-Au0056639	NCP	ug/L	0.01	0.01	3.4	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorononanoic acid (PFNA)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	TW23-Au0056639	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	TW23-Au0056639	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	TW23-Au0056639	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	TW23-Au0056639	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	TW23-Au0056639	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	TW23-Au0056639	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	TW23-Au0056639	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	TW23-Au0056639	NCP	ug/L	0.12	0.13	7.6	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	TW23-Au0056639	NCP	ug/L	0.05	0.06	16	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	TW23-Au0056639	NCP	ug/L	0.04	0.04	9.5	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	TW23-Au0056639	NCP	ug/L	0.07	0.07	5.3	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	TW23-Au0056639	NCP	ug/L	0.06	0.06	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	TW23-Au0056639	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	TW23-Au0056639	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Paige Howarth	Analytical Services Manager
Jonathon Angell	Senior Analyst-Sample Properties
Sarah McCallion	Senior Analyst-PFAS



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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QLD 4008

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Quentin Xu**

Report **1020138-L**
Project name CS ENERGY CALLIDE POWER PLANT
Project ID 107259
Received Date Aug 25, 2023

Client Sample ID			**FTG_TSP1_1**	**FTG_TSP1_2**	**FTG_TSP1_3**	**FTG_TSP2_1**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B23-Au0064264**	**B23-Au0064265**	**B23-Au0064266**	**B23-Au0064267**
Date Sampled			**Aug 24, 2023**	**Aug 24, 2023**	**Aug 24, 2023**	**Aug 24, 2023**
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid[C01]		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.2	9.2	9.4	9.3
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	33	47	27	50
13C5-PFPeA (surr.)	1	%	97	114	99	123
13C5-PFHxA (surr.)	1	%	98	100	102	96
13C4-PFHpA (surr.)	1	%	113	99	110	113
13C8-PFOA (surr.)	1	%	100	112	104	102
13C5-PFNA (surr.)	1	%	122	131	141	135
13C6-PFDA (surr.)	1	%	93	105	106	104
13C2-PFUnDA (surr.)	1	%	89	111	108	108
13C2-PFDoDA (surr.)	1	%	83	112	112	110
13C2-PFTeDA (surr.)	1	%	53	69	62	58
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			FTG_TSP1_1	FTG_TSP1_2	FTG_TSP1_3	FTG_TSP2_1
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B23-Au0064264	B23-Au0064265	B23-Au0064266	B23-Au0064267
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	98	112	114	117
D3-N-MeFOSA (surr.)	1	%	64	118	101	81
D5-N-EtFOSA (surr.)	1	%	87	148	143	98
D7-N-MeFOSE (surr.)	1	%	65	94	98	86
D9-N-EtFOSE (surr.)	1	%	72	109	68	63
D5-N-EtFOSAA (surr.)	1	%	94	126	134	112
D3-N-MeFOSAA (surr.)	1	%	91	110	104	107
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	99	105	102	111
18O2-PFHxS (surr.)	1	%	135	132	136	125
13C8-PFOS (surr.)	1	%	114	131	130	134
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	83	76	80	85
13C2-6:2 FTSA (surr.)	1	%	67	67	89	107
13C2-8:2 FTSA (surr.)	1	%	109	130	121	130
13C2-10:2 FTSA (surr.)	1	%	65	86	80	73
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			FTG_TSP2_2	FTG_TSP2_3	FTG_TSP2_3 DUP
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B23-Au0064268	B23-Au0064269	B23-Au0064270
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit			
AUS Leaching Procedure					
Leachate Fluid[C01]		comment	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.4	9.3	9.3
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	82	54	72
13C5-PFPeA (surr.)	1	%	127	112	128
13C5-PFHxA (surr.)	1	%	99	93	86
13C4-PFHpA (surr.)	1	%	106	116	112
13C8-PFOA (surr.)	1	%	112	102	100
13C5-PFNA (surr.)	1	%	142	136	134
13C6-PFDA (surr.)	1	%	112	111	105
13C2-PFUnDA (surr.)	1	%	113	111	107
13C2-PFDoDA (surr.)	1	%	110	115	103
13C2-PFTeDA (surr.)	1	%	77	65	58
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	127	119	105
D3-N-MeFOSA (surr.)	1	%	106	91	109
D5-N-EtFOSA (surr.)	1	%	155	137	139
D7-N-MeFOSE (surr.)	1	%	111	102	82
D9-N-EtFOSE (surr.)	1	%	98	70	60
D5-N-EtFOSAA (surr.)	1	%	126	126	106
D3-N-MeFOSAA (surr.)	1	%	117	114	104

Client Sample ID			FTG_TSP2_2	FTG_TSP2_3	FTG_TSP2_3 DUP
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B23-Au0064268	B23-Au0064269	B23-Au0064270
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	108	124	121
18O2-PFHxS (surr.)	1	%	134	132	126
13C8-PFOS (surr.)	1	%	143	133	118
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	79	77	80
13C2-6:2 FTSA (surr.)	1	%	71	77	93
13C2-8:2 FTSA (surr.)	1	%	110	116	106
13C2-10:2 FTSA (surr.)	1	%	75	91	68
PFASs Summations					
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Aug 25, 2023	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Aug 25, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Aug 25, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Aug 25, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Aug 25, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CS ENERGY CALLIDE POWER PLANT
Project ID: 107259

Order No.:
Report #: 1020138
Phone: (07) 3637 2900
Fax:

Received: Aug 25, 2023 9:30 AM
Due: Aug 30, 2023
Priority: 3 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						HOLD	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	FTG_TSP1_1	Aug 24, 2023		AUS Leachate - Reagent Water	B23-Au0064264		X	X
2	FTG_TSP1_2	Aug 24, 2023		AUS Leachate - Reagent Water	B23-Au0064265		X	X
3	FTG_TSP1_3	Aug 24, 2023		AUS Leachate - Reagent Water	B23-Au0064266		X	X
4	FTG_TSP2_1	Aug 24, 2023		AUS Leachate - Reagent Water	B23-Au0064267		X	X
5	FTG_TSP2_2	Aug 24, 2023		AUS Leachate - Reagent Water	B23-Au0064268		X	X
6	FTG_TSP2_3	Aug 24, 2023		AUS Leachate - Reagent	B23-Au0064269		X	X

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Phone: (07) 3637 2900
Fax:

Received: Aug 25, 2023 9:30 AM
Due: Aug 30, 2023
Priority: 3 Day
Contact Name: Quentin Xu

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						HOLD	AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
				Water				
7	FTG_TSP2_3 DUP	Aug 24, 2023		AUS Leachate - Reagent Water	B23-Au0064270		X	X
8	TRIP BLANK	Aug 24, 2023		Trip Blank (liquid)	B23-Au0064271	X		
Test Counts						1	7	7

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Au0064268	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B23-Au0064268	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Au0064268	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Au0064268	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Au0064268	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Au0064268	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Au0064268	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Au0064268	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Au0064268	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Au0064268	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Paige Howarth	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
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Attention: **- Jack Findlay**

Report **1022146-L**
Project name CS ENERGY CALLIDE POWER PLANT
Project ID 107259
Received Date Sep 01, 2023

Client Sample ID			**FTGSP1.2_310823**	**FTGSP1.2_310823 DUP**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B23-Se0000448**	**B23-Se0011296**
Date Sampled			**Aug 31, 2023**	**Aug 31, 2023**
Test/Reference	LOR	Unit		
AUS Leaching Procedure				
Leachate Fluid[C01]		comment	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0
pH (off)	0.1	pH Units	9.3	9.4
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	96	85
13C5-PFPeA (surr.)	1	%	112	127
13C5-PFHxA (surr.)	1	%	126	137
13C4-PFHpA (surr.)	1	%	129	150
13C8-PFOA (surr.)	1	%	121	127
13C5-PFNA (surr.)	1	%	112	122
13C6-PFDA (surr.)	1	%	115	116
13C2-PFUnDA (surr.)	1	%	115	132
13C2-PFDoDA (surr.)	1	%	100	113
13C2-PFTeDA (surr.)	1	%	59	106
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05

Client Sample ID			FTGSP1.2_310823	FTGSP1.2_310823 DUP
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B23-Se0000448	B23-Se0011296
Date Sampled			Aug 31, 2023	Aug 31, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	109	118
D3-N-MeFOSA (surr.)	1	%	103	122
D5-N-EtFOSA (surr.)	1	%	99	124
D7-N-MeFOSE (surr.)	1	%	62	96
D9-N-EtFOSE (surr.)	1	%	69	80
D5-N-EtFOSAA (surr.)	1	%	87	106
D3-N-MeFOSAA (surr.)	1	%	92	98
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	132	132
18O2-PFHxS (surr.)	1	%	130	139
13C8-PFOS (surr.)	1	%	129	122
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	98	96
13C2-6:2 FTSA (surr.)	1	%	109	121
13C2-8:2 FTSA (surr.)	1	%	88	112
13C2-10:2 FTSA (surr.)	1	%	94	102
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Sep 06, 2023	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Sep 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Sep 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Sep 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Sep 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Company Name: Enviropacific Services P/L (QLD)
Address: 1392 Kingsford Smith Drive
Pinkenba
QLD 4008

Project Name: CS ENERGY CALLIDE POWER PLANT
Project ID: 107259

Order No.:
Report #: 1022146
Phone: (07) 3637 2900
Fax:

Received: Sep 6, 2023 12:06 PM
Due: Sep 8, 2023
Priority: 2 Day
Contact Name: - Jack Findlay

Eurofins Analytical Services Manager : Zoe Flynn

Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	FTGSP1.2_31 0823	Aug 31, 2023		AUS Leachate - Reagent Water	B23-Se0000448	X		X
2	FTGSP1.2_31 0823 DUP	Aug 31, 2023		Soil	B23-Se0000449		X	X
3	FTGSP1.2_31 0823	Aug 31, 2023		Soil	B23-Se0011295		X	X
4	FTGSP1.2_31 0823 DUP	Aug 31, 2023		AUS Leachate - Reagent Water	B23-Se0011296	X		X
Test Counts						2	2	4

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Se0000448	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B23-Se0000448	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Se0000448	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Se0000448	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Se0000448	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Se0000448	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Se0000448	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Se0000448	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Se0000448	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Se0000448	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B23-Se0011296	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorooctanoic acid (PFOA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B23-Se0011296	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B23-Se0011296	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B23-Se0011296	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B23-Se0011296	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B23-Se0011296	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B23-Se0011296	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B23-Se0011296	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B23-Se0011296	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B23-Se0011296	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Paige Howarth	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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9. APPENDIX D – SURVEY

MGA94 ZONE 56

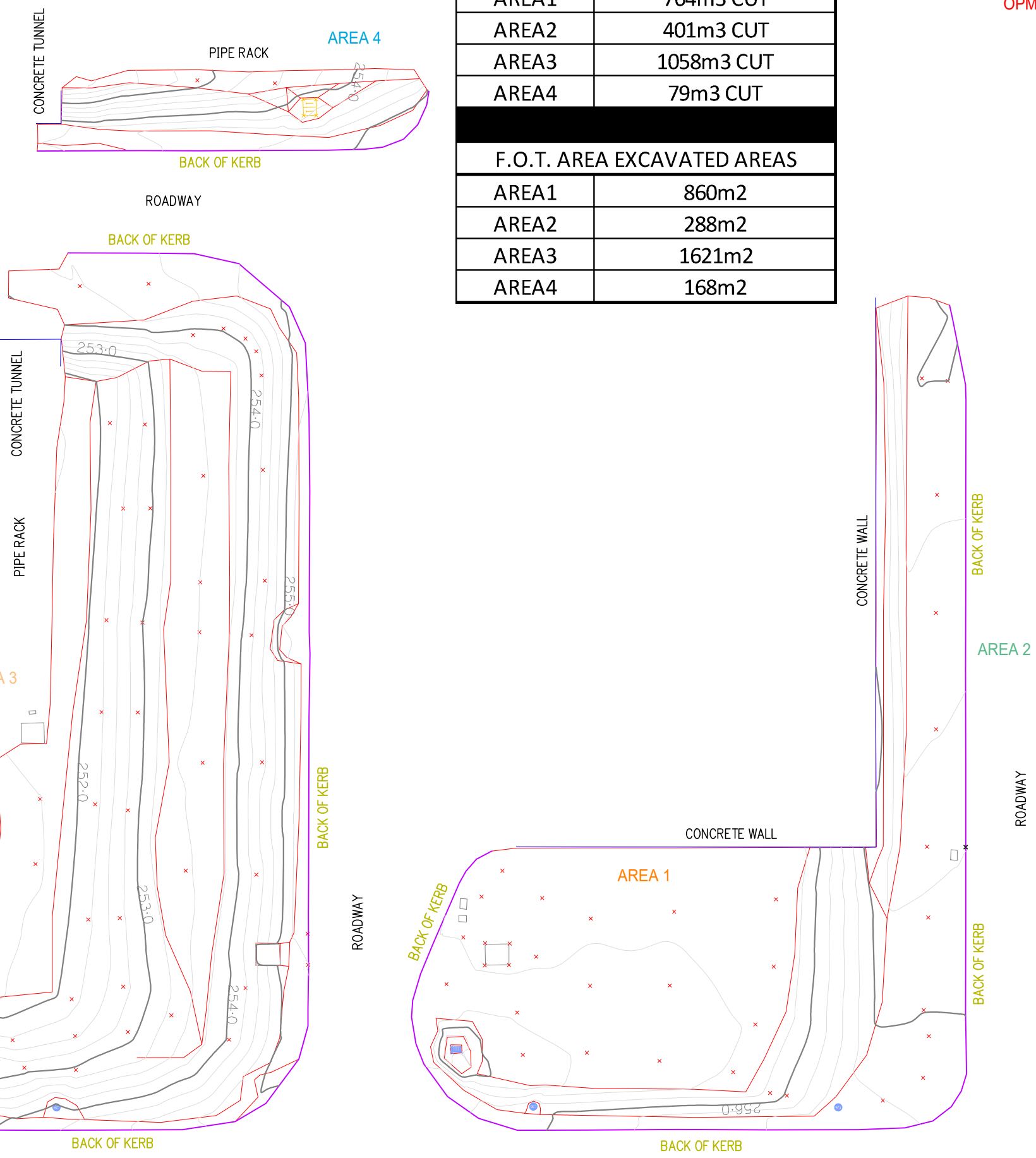
LEGEND

- 1·0m CONTOUR
- 0·25m CONTOUR
- ROAD KERB & CHANNELING
- RETAINING WALL
- TOPOGRAPHIC FEATURES
- SURVEY CONTROL

F.O.T. AREA EXCAVATION VOLUMES	
AREA1	764m3 CUT
AREA2	401m3 CUT
AREA3	1058m3 CUT
AREA4	79m3 CUT

F.O.T. AREA EXCAVATED AREAS	
AREA1	860m2
AREA2	288m2
AREA3	1621m2
AREA4	168m2

OPM59319



NOTES:
- SERVICES ARE INDICATIVE, ONLY VISIBLE STRUCTURES LOCATED.
- SOME INFORMATION IN TURNED OFF LAYERS.
- INFORMATION IN DESCRIPTIVE LAYERS.
- PLAN COMPILED FROM SURVEY RECORDS.
- SURVEY COMPLETED 05/12/2022 VIA GNSS MEASUREMENTS.

5 0 10 20m

SCALE 1:400 (A3)

THIS PLAN HAS BEEN PREPARED TO CLIENT SPECIFICATIONS AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE WITHOUT CONFIRMING THAT THE DATA IS FIT FOR THE INTENDED USE BY CONTACTING FREDRIKSEN MACLEAN & ASSOCIATES

FREDRIKSEN MACLEAN & ASSOCIATES
CONSULTING SURVEYORS
GLADSTONE, BILOELA & MOURA
HEAD OFFICE
9 DREWE STREET
PH (07)49725677
P.O. BOX 1245
EMAIL: mail@fredmac.com.au

PROPERTY DESC.	
LOCALITY	CALLIDE
LOCAL AUTHORITY	BANANA SHIRE COUNCIL
LEVEL DATUM	AHDD
LEVEL ORIGIN	PM 59319 RL: 258·817
HORIZONTAL DATUM	MGA94 ZONE 56 PLANAR
MERIDIAN	MGA VIDE GNSS
HORIZONTAL ORIGIN	PM 59319 E: 258467·923 N: 7305090·057

SCALE	
1:400/A3	
SURVEYED	SEM
F. BOOKS	
DRAFTED	SEM
CHECKED	SEM
APPROVED	ASM

DATE	DETAILS	INIT.
14/12/22	ISSUE	SEM

AMENDMENTS

CLIENT: ENVIROPACIFIC

TITLE: FINAL AS-CONSTRUCTED SURVEY FOT AREAS 1-4

PROJECT: CALLIDE POWER STATION, CALLIDE

SHEET 1 OF 2 SHEETS

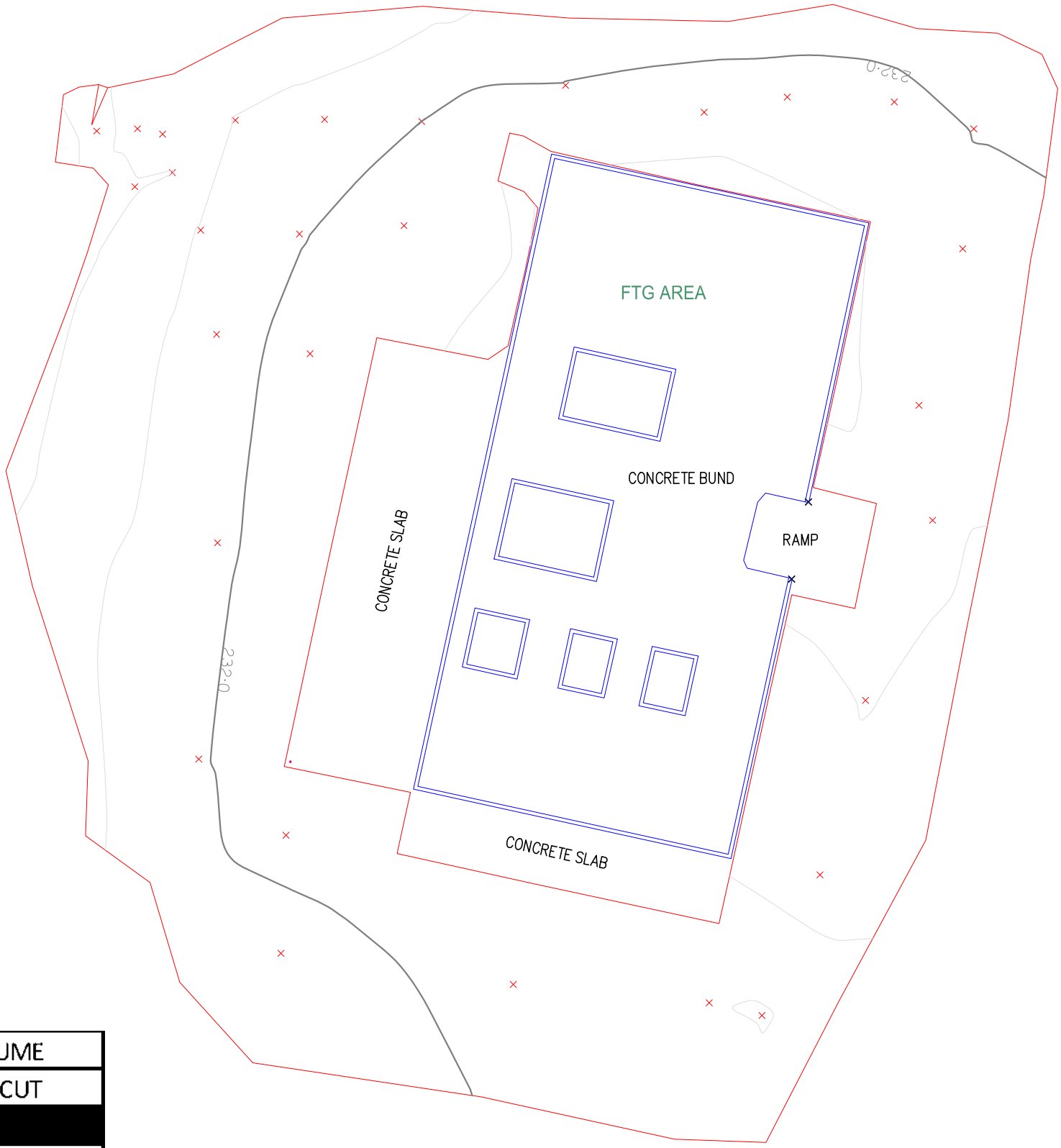
DRAWING NUMBER: 5797-1-1

REVISION: A

MGA94 ZONE 56

LEGEND

- 1·0m CONTOUR
- 0·25m CONTOUR
- ROAD KERB & CHANNELING
- RETAINING WALL
- TOPOGRAPHIC FEATURES
- SURVEY CONTROL



F.T.G. EXCAVATION VOLUME	
F.T.G	852m3 CUT
F.T.G. EXCAVATION AREA	
F.T.G	1123m2
F.T.G. CONCRETE BUND REPAIRED	
INTERNAL SLAB AREA	232m2
BUND WALL AREA	52m2

NOTES:
- SERVICES ARE INDICATIVE, ONLY VISIBLE STRUCTURES LOCATED.
- SOME INFORMATION IN TURNED OFF LAYERS.
- INFORMATION IN DESCRIPTIVE LAYERS.
- PLAN COMPILED FROM SURVEY RECORDS.
- SURVEY COMPLETED 05/12/2022 VIA GNSS MEASUREMENTS.

5 0 2 5 10m

SCALE 1:250 (A3)

THIS PLAN HAS BEEN PREPARED TO CLIENT SPECIFICATIONS AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE WITHOUT CONFIRMING THAT THE DATA IS FIT FOR THE INTENDED USE BY CONTACTING FREDRIKSEN MACLEAN & ASSOCIATES

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HEAD OFFICE
9 DREWE STREET
PH (07)49725677
P.O. BOX 1245
EMAIL: mail@fredmac.com.au

PROPERTY DESC.	
LOCALITY	CALLIDE
LOCAL AUTHORITY	BANANA SHIRE COUNCIL
LEVEL DATUM	AHDD
LEVEL ORIGIN	PM 59319 RL: 258·817
HORIZONTAL DATUM	MGA94 ZONE 56 PLANAR
MERIDIAN	MGA VIDE GNSS
HORIZONTAL ORIGIN	PM 59319 E: 258467·923 N: 7305090·057

SCALE	1:250/A3
SURVEYED	SEM
F. BOOKS	
DRAFTED	SEM
CHECKED	SEM
APPROVED	ASM

DATE	DETAILS	INIT.
14/12/22	ISSUE	SEM

AMENDMENTS

CLIENT: ENVIROPACIFIC

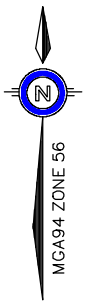
TITLE: FINAL AS-CONSTRUCTED SURVEY FTG AREA

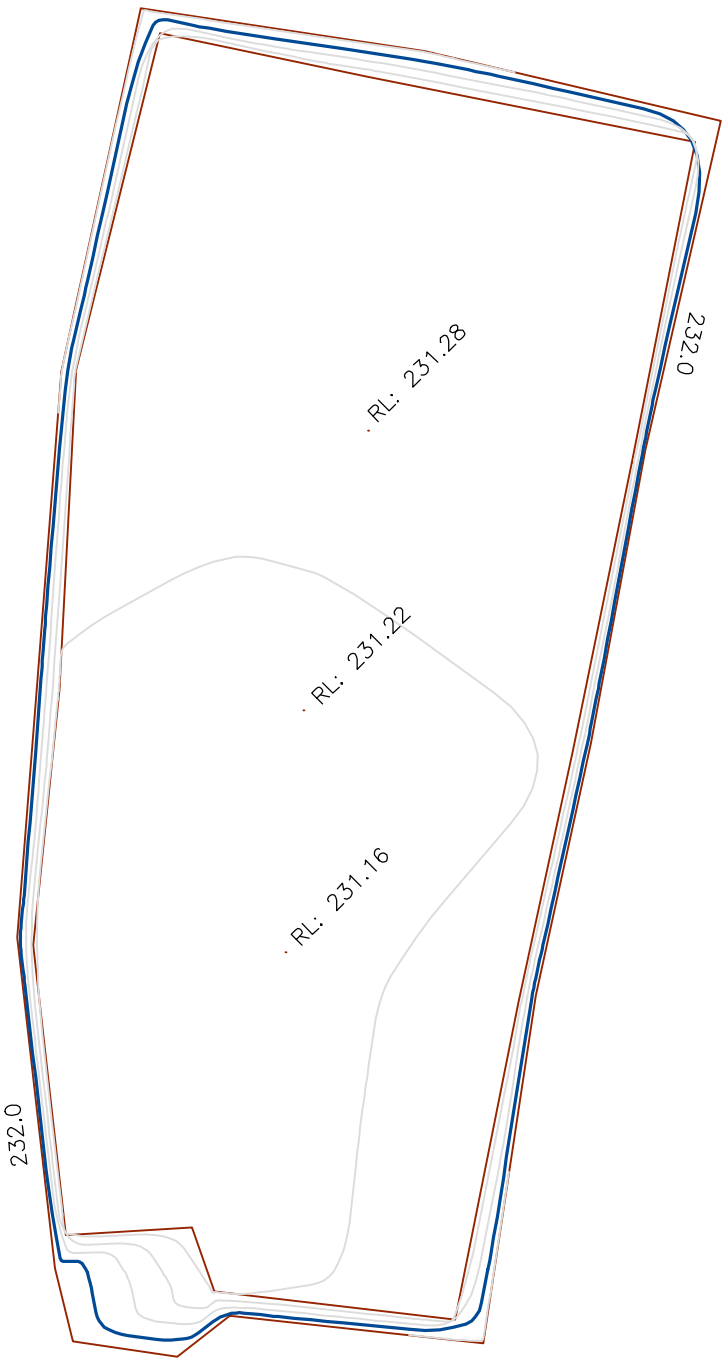
PROJECT: CALLIDE POWER STATION, CALLIDE

SHEET 2 OF 2 SHEETS

DRAWING NUMBER: 5797-1-1

REVISION: A





PIT VOLUME: 437m^3

NOTES:
- SOME INFORMATION IN TURNED OFF LAYERS.
- INFORMATION IN DESCRIPTIVE LAYERS.
- CONTOURS HAVE BEEN PROJECTED THROUGH STRUCTURES TO PROVIDE APPROXIMATE LEVELS.
- SURVEY COMPLETED 22/8/23 VIA GNSS MEASUREMENTS.

3 0 2 5 10m

SCALE 1:200 (A3)

THIS PLAN HAS BEEN PREPARED TO CLIENT SPECIFICATIONS AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE WITHOUT CONFIRMING THAT THE DATA IS FIT FOR THE INTENDED USE BY CONTACTING FREDRIKSEN MACLEAN & ASSOCIATES

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HEAD OFFICE
9 DREWE STREET
PH (07)49725677
P.O. BOX 1245
EMAIL: mail@fredmac.com.au

PROPERTY DESC.	LOT 1 ON RP615528
LOCALITY	MOUNT MURCHISON
LOCAL AUTHORITY	BANANA SHIRE COUNCIL
LEVEL DATUM	AHDD
LEVEL ORIGIN	SM2 RL 239·565
HORIZONTAL DATUM	MGA94 ZONE 56 GRID
MERIDIAN	MGA VIDE GNSS
HORIZONTAL ORIGIN	SM2 E: 258241·757 N: 7305388·429

SCALE 1:200/A3

SURVEYED	AF
F. BOOKS	
DRAFTED	ZCS
CHECKED	ZCS
APPROVED	ASM

DATE	DETAILS	INIT.
25/8/23	ISSUE	ZCS

AMENDMENTS

CLIENT: ENVIROPACIFIC

TITLE: DETAIL AND CONTOUR CALLIDE POWER STATION

PROJECT: FIRE TRAINING GROUND, CS ENERGY

SHEET 1 OF 1 SHEETS

DRAWING NUMBER: 5797-2-1

REVISION: A

10. APPENDIX E – LEVEL 1 GEOTECHNICAL REPORT

Construction Sciences

CS Energy – FOG Area 1

Prepared for Enviropacific Pty Ltd

20/12/2022



Document Information	
Prepared for	Enviropacific Pty Ltd
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Date	20/12/2022
Version Number	01

Contact Information	
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T. Battisson
Area Manager
Effective date: 20/12/2022

DOCUMENT HISTORY

Version	Effective Date	Revision	Author	Reviewer	Recipient
01	20/12/2022	01	T. Battisson	T. Battisson	J. Vahtera

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Contents

Introduction 1
Specification Requirements 2
Site Works 2
Compaction Control Testing 2
Conclusion 2

Appendices

Appendix A Individual Lot Certification
Appendix B Field Density Test Results
Appendix C Allotment Fill Map

Figures

No table of contents entries found.

Tables

Table 1 Summary of field density test results - 3

Introduction

Construction Sciences is the largest private provider of construction materials testing services across Australia. We have a total staff of over 600 staff in 48 permanent offices/laboratories.

We have provided QA testing services to some of the largest road and mining infrastructure projects in these states, as well as overseas.

Over the last 3 to 4 years, Construction Sciences has established more site laboratories for road, rail, mining, and other large infrastructure projects than any other company.

We benefit our clients with the following clear differentiators;

- **Staff Mobilisation:** Construction Sciences' geographic expansion and mobility allow for teams to be available when required, and currently we have the lion's share of major projects in Australia.
- **Quality Management:** Construction Sciences' purpose-built software, COMPLY provides our clients with confidence, by knowing project data is securely stored. COMPLY has a built-in secure audit trail and a fully tracked Quality system. We are also ISO9001 compliant and certified.
- **Client Relationships:** We listen to your needs and respond with innovative solutions that are tailored for your business. We believe in building relationships with our staff and local community.
- **Safety:** At Construction Sciences we embrace a 'safety' culture and it is a key consideration with every project. Currently we are over 2 years LTI (lost time injury) free.

Construction Sciences Pty Ltd was commissioned by Enviropacific Pty Ltd to provide Level 1 inspection and testing services for the placement of fill at the residential development:-

PROJECT: CS Energy – FOG Area 1

ADDRESS: Callide Power Station, Callide Qld.

The earthworks were carried out from 7/11/2022 to 28/11/2022.

Specification Requirements

Filling was carried out in accordance with AS3798-2007 *'Guidelines on earthworks for commercial and residential developments'* and with the project specification prepared for the project.

The specification requirements were that all fill was to be placed and compacted in layers to a density ratio of not less than 95% of the maximum dry density as determined by AS1289.5.1.1 (standard compaction).

Site Works

The area to be filled was stripped and proof rolled in accordance with the specification requirements. The fill material generally comprised of Clayey Gravel.

Compaction Control Testing

Compaction control tests were carried out at regular intervals throughout the placement of fill in accordance with the minimum test frequency recommendations included in AS3798-2007 *'Guidelines on earthworks for commercial and residential developments'*. All test results are included in the Appendix B. A summary of the test results is included as Table 1. A total of 46 field density tests were carried out throughout the earthworks. The average density ratio was 100% with a standard deviation of 1.05%.

The location of all tests is shown on the attached Site Map in Appendix C.

Conclusion

It is considered that the placement of fill at, Callide Power Station, Callide Qld. was carried out in a controlled manner and the fill was compacted to a dry density ratio not less than the specified requirement. It is concluded that the fill may be deemed to be *'controlled fill'* in accordance with AS2870 – 2011 *'Residential Slabs & Footings'*.

Table 1 Summary of field density test results - CS Energy – FOG Area 1

Sample Number	Date Sampled	Field Moisture (%)	OMC (%)	Field Density (t/m³)	MDD (t/m³)	Dry Density Ratio (%)
4708/S/69249	14/11/2022	12.1	13.5	1.89	1.91	99.0
4708/S/69250	14/11/2022	12.9	13.5	1.87	1.89	98.5
4708/S/69251	14/11/2022	11.9	13.5	1.89	1.89	100.0
4708/S/69162	7/11/2022	12.9	12.5	1.90	1.90	100.0
4708/S/69163	7/11/2022	12.7	13.0	1.89	1.90	100.0
4708/S/69164	7/11/2022	13.0	14.5	1.89	1.88	100.0
4708/S/69165	8/11/2022	12.0	13.0	1.94	1.90	102.0
4708/S/69166	8/11/2022	11.8	13.0	1.94	1.90	102.0
4708/S/69167	8/11/2022	12.2	13.5	1.900	1.89	100.5
4708/S/69168	9/11/2022	12.2	13.0	1.88	1.88	100.0
4708/S/69169	9/11/2022	12.1	13.5	1.90	1.89	100.5
4708/S/69170	9/11/2022	11.8	13.0	1.91	1.89	101.0
4708/S/69171	10/11/2022	12.2	13.0	1.87	1.89	98.5
4708/S/69172	10/11/2022	12.0	13.5	1.89	1.89	100.0
4708/S/69173	10/11/2022	12.5	13.0	1.87	1.89	99.0
4708/S/69252	15/11/2022	13.0	15.0	1.87	1.89	99.0
4708/S/69253	15/11/2022	13.6	16.0	1.83	1.87	97.5
4708/S/69254	15/11/2022	13.0	14.0	1.84	1.87	98.5
4708/S/69174	16/11/2022	13.2	13.5	1.88	1.89	99.0
4708/S/69175	16/11/2022	12.9	13.0	1.90	1.88	101.0
4708/S/69176	16/11/2022	11.8	13.0	1.90	1.88	101.0
4708/S/69177	17/11/2022	12.1	13.0	1.88	1.89	99.5
4708/S/69178	17/11/2022	11.9	13.0	1.89	1.88	100.5
4708/S/69179	17/11/2022	13.1	13.0	1.85	1.86	99.5
4708/S/69214	18/11/2022	12.1	13.5	1.89	1.89	100.0
4708/S/69215	18/11/2022	12.1	13.5	1.90	1.88	101.0
4708/S/69216	18/11/2022	11.8	13.5	1.89	1.89	100.5
4708/S/69258	21/11/2022	12.6	14.0	1.94	1.88	103.0
4708/S/69259	21/11/2022	13.1	14.0	1.90	1.87	101.5
4708/S/69260	21/11/2022	12.8	14.0	1.90	1.88	101.5
4708/S/69274	22/11/2022	14.0	14.0	1.87	1.88	99.5
4708/S/69275	22/11/2022	13.8	14.0	1.90	1.87	101.5
4708/S/69276	22/11/2022	14.3	13.0	1.87	1.87	100.0
4708/S/69325	23/11/2022	13.5	13.5	1.88	1.87	100.0
4708/S/69326	23/11/2022	14.2	13.5	1.87	1.87	100.0
4708/S/69327	23/11/2022	13.5	14.0	1.89	1.87	101.0
4708/S/69328	23/11/2022	14.0	13.5	1.87	1.88	99.5
4708/S/69255	19/11/2022	12.4	14.0	1.86	1.87	99.5
4708/S/69256	19/11/2022	12.7	14.0	1.86	1.87	99.5
4708/S/69257	19/11/2022	12.3	13.5	1.87	1.87	100.0
4708/S/69411	25/11/2022	12.8	13.5	1.86	1.87	99.5
4708/S/69412	25/11/2022	12.3	13.5	1.88	1.86	101.0
4708/S/69413	25/11/2022	12.4	14.0	1.88	1.88	100.0
4708/S/69433	28/11/2022	13.2	13.5	1.85	1.86	99.0
4708/S/69434	28/11/2022	13.1	14.0	1.86	1.86	100.0
4708/S/69435	28/11/2022	13.0	14.5	1.85	1.84	100.0

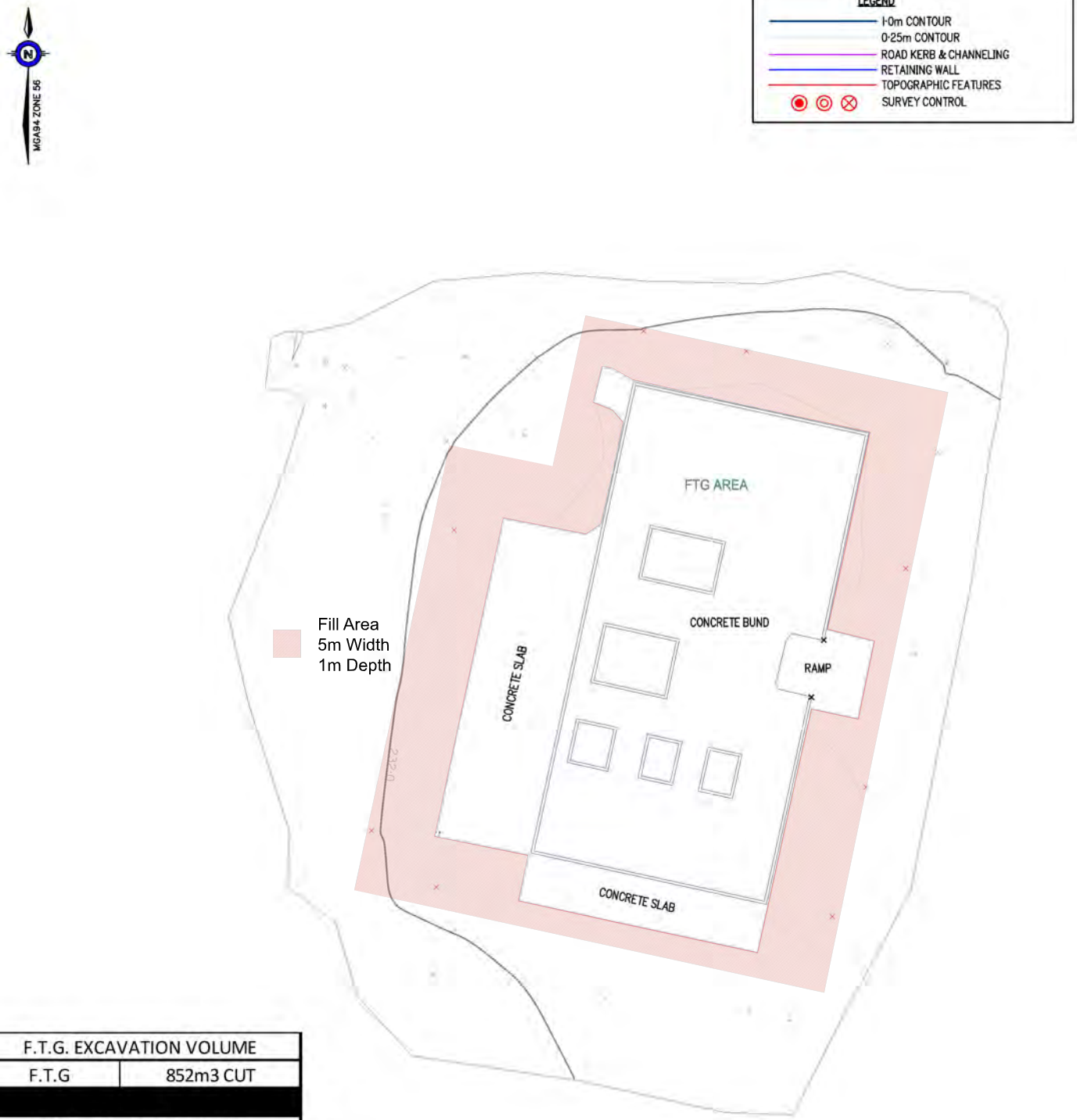
No. of tests:	46	**Mean:**	100%	**Standard Dev:**	1.05%

Notes:

1. Level of test positions determined relative to on site benchmark.
2. Standard laboratory compaction used, AS1289.5.1.1.

Appendix C

Allotment Fill Map



F.T.G. EXCAVATION VOLUME	
F.T.G	852m3 CUT
F.T.G. EXCAVATION AREA	
F.T.G	1123m2
F.T.G. CONCRETE BUND REPAIRED	
INTERNAL SLAB AREA	232m2
BUND WALL AREA	52m2

NOTES:
- SERVICES ARE INDICATIVE, ONLY VISIBLE STRUCTURES LOCATED.
- SOME INFORMATION IN TURNED OFF LAYERS.
- INFORMATION IN DESCRIPTIVE LAYERS.
- PLAN COMPILED FROM SURVEY RECORDS.
- SURVEY COMPLETED 05/12/2022 VIA GNSS MEASUREMENTS.

5 0 2 5 10m

SCALE 1:250 (A3)

THIS PLAN HAS BEEN PREPARED TO CLIENT SPECIFICATIONS AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE WITHOUT CONFIRMING THAT THE DATA IS FIT FOR THE INTENDED USE BY CONTACTING FREDRIKSEN MACLEAN & ASSOCIATES

FREDRIKSEN MACLEAN & ASSOCIATES
CONSULTING SURVEYORS
GLADSTONE, BILOELA & MOURA
HEAD OFFICE
9 DREWE STREET
PH (07)49725677
P.O. BOX 1245
EMAIL: mail@fredmac.com.au

PROPERTY DESC.	
LOCALITY	CALLIDE
LOCAL AUTHORITY	BANANA SHIRE COUNCIL
LEVEL DATUM	AHDD
LEVEL ORIGIN	PM 59319 RL: 258·817
HORIZONTAL DATUM	MGA94 ZONE 56 PLANAR
MERIDIAN	MGA VIDE GNSS
HORIZONTAL ORIGIN	PM 59319 E: 258467·923 N: 7305090·057

SCALE	1:250/A3
SURVEYED	SEM
F. BOOKS	
DRAFTED	SEM
CHECKED	SEM
APPROVED	ASM

DATE	DETAILS	INT.
14/12/22	ISSUE	SEM

AMENDMENTS

CLIENT: ENVIROPACIFIC

TITLE: FINAL AS-CONSTRUCTED SURVEY FTG AREA

PROJECT: CALLIDE POWER STATION, CALLIDE

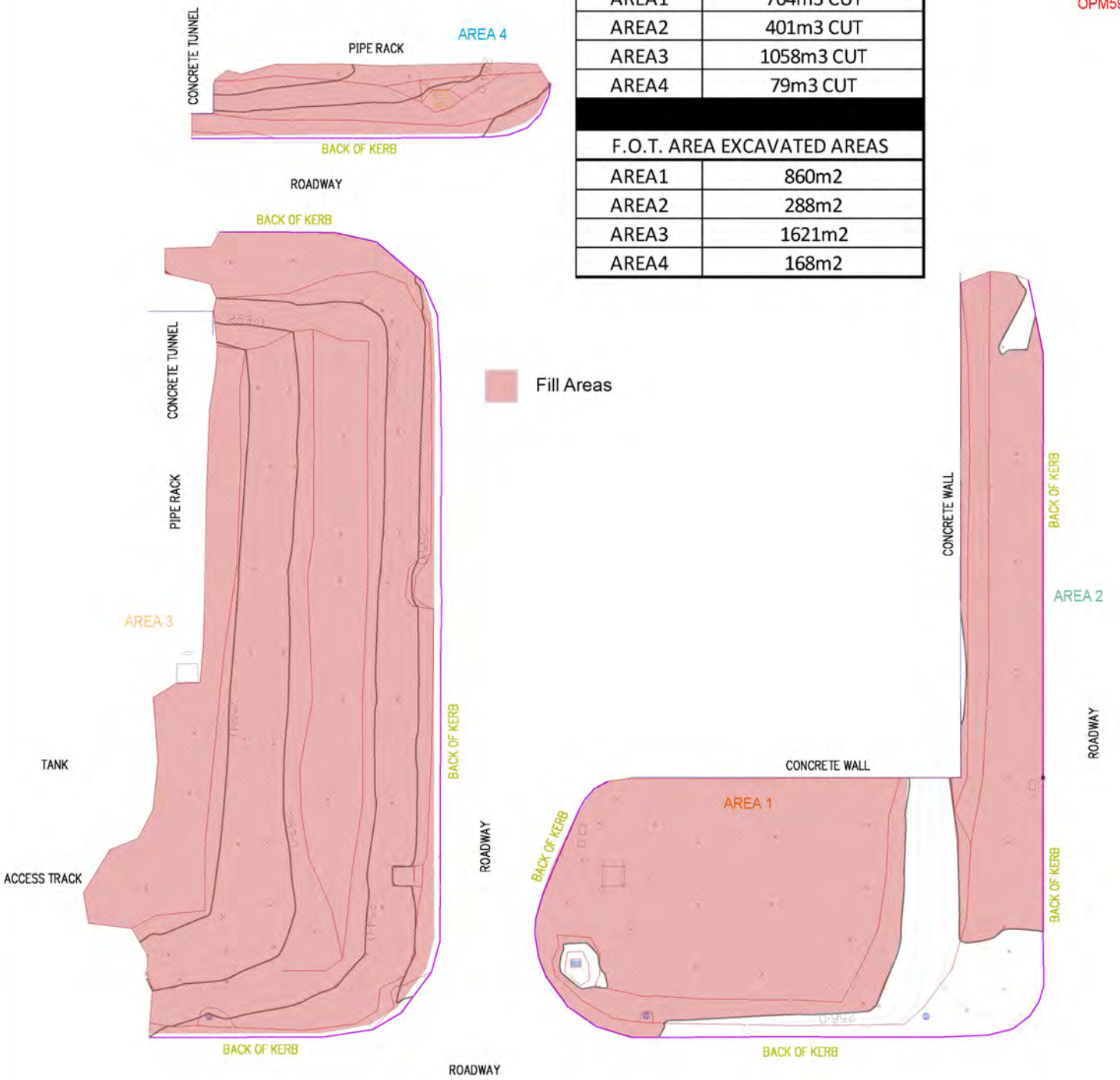
SHEET 2 OF 2 SHEETS

DRAWING NUMBER: 5797-1-1

REVISION: A

OPM59319

AREA1	704m3 CUT
AREA2	401m3 CUT
AREA3	1058m3 CUT
AREA4	79m3 CUT
F.O.T. AREA EXCAVATED AREAS	
AREA1	860m2
AREA2	288m2
AREA3	1621m2
AREA4	168m2



Appendix B
Field Density Test Results

Construction Sciences

Construction Sciences Pty Ltd
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Laboratory: **Gladstone Laboratory**
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Fax: 07 4972 7048
Email: Gladstone@constructionsciences.net

DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/25999-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 1
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14832
Component:	CS Energy - FOT Area 1	Client Reference/s:	09/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	25/11/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69168	4708/S/69169	4708/S/69170	
ID / Client ID	FOT	FOT	FOT	
Lot Number	FOT Area 1	FOT Area 1	FOT Area 1	
Date / Time Tested	9/11/2022 10:14	9/11/2022 12:30	9/11/2022 13:06	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258436.421	258438.104	258446.110	
Northing	7305006.253	7305010.982	7305015.237	
RL m	Layer 4	Layer 5	South Batter	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69168	4708/S/69169	4708/S/69170	
MDR Sample Date / Update	9/11/2022	9/11/2022	9/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	12.2	12.1	11.8	
Optimum Moisture Content (%)	13.0	13.5	13.0	
Variation from OMC (%)	1.0% Drier than OMC	1.0% Drier than OMC	1.0% Drier than OMC	
Moisture Ratio (%)	**92.5**	**91.0**	**91.5**	
Density Test Results:				
Field Wet Density (t/m³)	2.11	2.12	2.14	
Field Dry Density (t/m³)	1.88	1.90	1.91	
Maximum Dry Density (t/m³)	1.88	1.89	1.89	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**100.0**	**100.5**	**101.0**	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing

NATA

Accreditation Number: 1986
Corporate Site Number: 4708



Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

Construction Sciences

Construction Sciences Pty Ltd
ABN: 74 128 806 735

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Laboratory: **Gladstone Laboratory**
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Email: Gladstone@constructionsciences.net

DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26000-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 1
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14833
Component:	CS Energy - FOT Area 1	Client Reference/s:	10/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	25/11/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69171	4708/S/69172	4708/S/69173	
ID / Client ID	fot	fot	fot	
Lot Number	FOT Area 1	FOT Area 1	FOT Area 1	
Date / Time Tested	10/11/2022 12:54	10/11/2022 10:14	10/11/2022 09:02	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258440.109	258420.414	258427.333	
Northing	7305000.126	7305004.286	7305011.801	
RL m	East Batter	Layer 5	Layer 5	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69171	4708/S/69172	4708/S/69173	
MDR Sample Date / Update	10/11/2022	10/11/2022	10/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	12.2	12.0	12.5	
Optimum Moisture Content (%)	13.0	13.5	13.0	
Variation from OMC (%)	1.0% Drier than OMC	1.5% Drier than OMC	0.5% Drier than OMC	
Moisture Ratio (%)	**94.0**	**88.0**	**96.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.10	2.12	2.10	
Field Dry Density (t/m³)	1.87	1.89	1.87	
Maximum Dry Density (t/m³)	1.89	1.89	1.89	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**98.5**	**100.0**	**99.0**	

Remarks

NATA

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 1986
Corporate Site Number: 4708



Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26002-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 2
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14850
Component:	CS Energy - FOT Area 1	Client Reference/s:	16/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	25/11/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69174	4708/S/69175	4708/S/69176	
ID / Client ID	FOT	FOT	FOT	
Lot Number	FOT Area 2	FOT Area 2	FOT Area 2	
Date / Time Tested	16/11/2022 10:37	16/11/2022 12:05	16/11/2022 13:47	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258451.117	258452.384	258455.103	
Northing	7305058.432	7305021.227	7305037.236	
RL m	Layer 1	Layer 2	Layer 3	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69174	4708/S/69175	4708/S/69176	
MDR Sample Date / Update	16/11/2022	16/11/2022	16/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	13.2	12.9	11.8	
Optimum Moisture Content (%)	13.5	13.0	13.0	
Variation from OMC (%)	0.0% Drier than OMC	0.0% Drier than OMC	1.0% Drier than OMC	
Moisture Ratio (%)	**98.5**	**98.5**	**91.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.12	2.14	2.12	
Field Dry Density (t/m³)	1.88	1.90	1.90	
Maximum Dry Density (t/m³)	1.89	1.88	1.88	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**99.0**	**101.0**	**101.0**	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing

NATA

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Corporate Site Number: 4708



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Form ID: W27ASRep Rev 1

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26003-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 2
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14851
Component:	CS Energy - FOG Area 1	Client Reference/s:	17/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	25/11/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69177	4708/S/69178	4708/S/69179	
ID / Client ID	FOT	FOT	FOT	
Lot Number	FOT Area 2	FOT Area 2	FOT Area 2	
Date / Time Tested	17/11/2022 10:37	17/11/2022 11:29	17/11/2022 12:53	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258458.296	258455.784	258456.345	
Northing	7305060.081	7305043.177	7305029.558	
RL m	Layer 4 TOP	Layer 4 TOP	Layer 4 TOP	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69177	4708/S/69178	4708/S/69179	
MDR Sample Date / Update	17/11/2022	17/11/2022	17/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	12.1	11.9	13.1	
Optimum Moisture Content (%)	13.0	13.0	13.0	
Variation from OMC (%)	1.0% Drier than OMC	1.0% Drier than OMC	0.0% Drier than OMC	
Moisture Ratio (%)	**91.5**	**91.0**	**99.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.11	2.11	2.10	
Field Dry Density (t/m³)	1.88	1.89	1.85	
Maximum Dry Density (t/m³)	1.89	1.88	1.86	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**99.5**	**100.5**	**99.5**	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing

NATA

Accreditation Number: 1986
Corporate Site Number: 4708



Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26038-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 2 Trench
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14844
Component:	CS Energy FOG Area 1 - Level 1	Client Reference/s:	15/11/2022 - Supervision
Area Description:	CS Energy FOG Area 1	Report Date / Page:	2/12/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69252	4708/S/69253	4708/S/69254	
ID / Client ID	FOT	FOT	FOT	
Lot Number	FOT Area 2 Trench	FOT Area 2 Trench	FOT Area 2 Trench	
Date / Time Tested	15/11/2022 10:23	15/11/2022 10:34	15/11/2022 10:50	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258450.614	258446.222	258451.255	
Northing	7305033.092	7305045.127	7305058.440	
RL m	Trench	Trench	Trench	
	Layer 3	Layer 4 Top	Layer 4 Top	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69252	4708/S/69253	4708/S/69254	
MDR Sample Date / Update	15/11/2022	15/11/2022	15/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	13.0	13.6	13.0	
Optimum Moisture Content (%)	15.0	16.0	14.0	
Variation from OMC (%)	2.0% Drier than OMC	2.5% Drier than OMC	1.0% Drier than OMC	
Moisture Ratio (%)	**85.5**	**84.5**	**91.5**	
Density Test Results:				
Field Wet Density (t/m³)	2.11	2.08	2.08	
Field Dry Density (t/m³)	1.87	1.83	1.84	
Maximum Dry Density (t/m³)	1.89	1.87	1.87	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**99.0**	**97.5**	**98.5**	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing

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Accreditation Number: 1986
Corporate Site Number: 4708



Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

Construction Sciences

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26039-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 3,4
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14857
Component:	CS Energy - FOT Area 3,4	Client Reference/s:	18/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	2/12/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69214	4708/S/69215	4708/S/69216	
ID / Client ID	FOT	FOT	FOT	
Lot Number	FOT Area 3,4	FOT Area 3,4	FOT Area 3,4	
Date / Time Tested	18/11/2022 10:14	18/11/2022 12:50	18/11/2022 13:10	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258385.116	258386.326	258393.220	
Northing	7305007.492	7305042.074	7305081.345	
RL m	Layer 1	Layer 2	Emb Middle	
	Area 3	Area 3	Area 4	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69214	4708/S/69215	4708/S/69216	
MDR Sample Date / Update	18/11/2022	18/11/2022	18/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	12.1	12.1	11.8	
Optimum Moisture Content (%)	13.5	13.5	13.5	
Variation from OMC (%)	1.5% Drier than OMC	1.5% Drier than OMC	1.5% Drier than OMC	
Moisture Ratio (%)	**89.0**	**89.5**	**87.5**	
Density Test Results:				
Field Wet Density (t/m³)	2.12	2.13	2.12	
Field Dry Density (t/m³)	1.89	1.90	1.89	
Maximum Dry Density (t/m³)	1.89	1.88	1.89	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**100.0**	**101.0**	**100.5**	

Remarks

NATA

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 1986
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Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26040-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 3,4
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14862
Component:	CS Energy - FOT Area 3,4	Client Reference/s:	19/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	2/12/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69255	4708/S/69256	4708/S/69257	
ID / Client ID	FOT	FOT	FOT	
Lot Number	FOT Area 3,4	FOT Area 3,4	FOT Area 3,4	
Date / Time Tested	19/11/2022 08:27	19/11/2022 09:47	19/11/2022 10:42	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258396.458	258391.227	258389.104	
Northing	7305052.109	7305033.808	7305083.640	
RL m	Layer 3	Layer 3	EMB Top	
	Area 3	Area 3	Area 4	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69255	4708/S/69256	4708/S/69257	
MDR Sample Date / Update	19/11/2022	19/11/2022	19/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	12.4	12.7	12.3	
Optimum Moisture Content (%)	14.0	14.0	13.5	
Variation from OMC (%)	1.5% Drier than OMC	1.5% Drier than OMC	1.5% Drier than OMC	
Moisture Ratio (%)	**90.0**	**90.5**	**90.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.08	2.09	2.10	
Field Dry Density (t/m³)	1.86	1.86	1.87	
Maximum Dry Density (t/m³)	1.87	1.87	1.87	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**99.5**	**99.5**	**100.0**	

Remarks

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26041-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 3
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14863
Component:	CS Energy - FOT Area 3	Client Reference/s:	21/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	2/12/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

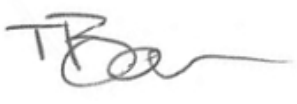
Sample Number	4708/S/69258	4708/S/69259	4708/S/69260	
ID / Client ID	FOT	FOT	FOT	
Lot Number	FOT Area 3	FOT Area 3	FOT Area 3	
Date / Time Tested	21/11/2022 11:12	21/11/2022 11:23	21/11/2022 11:40	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258390.227	258392.761	258389.426	
Northing	7305023.663	7305036.458	7305053.197	
RL m	Layer 5	Layer 5	Layer 5	
	Area 3	Area 3	Area 3	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69258	4708/S/69259	4708/S/69260	
MDR Sample Date / Update	21/11/2022	21/11/2022	21/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	12.6	13.1	12.8	
Optimum Moisture Content (%)	14.0	14.0	14.0	
Variation from OMC (%)	1.5% Drier than OMC	1.0% Drier than OMC	1.0% Drier than OMC	
Moisture Ratio (%)	**88.5**	**93.5**	**92.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.18	2.15	2.15	
Field Dry Density (t/m³)	1.94	1.90	1.90	
Maximum Dry Density (t/m³)	1.88	1.87	1.88	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**103.0**	**101.5**	**101.5**	

Remarks

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26046-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FTG
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14865
Component:	CS Energy - FOT Area 3, FTG	Client Reference/s:	22/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	2/12/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69274	4708/S/69275	4708/S/69276	
ID / Client ID	FTG	FTG	FTG	
Lot Number	FTG	FTG	FTG	
Date / Time Tested	22/11/2022 09:42	22/11/2022 09:57	22/11/2022 10:14	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258060.450	258072.198	258064.401	
Northing	7305460.179	7305471.882	7305499.072	
RL m	Layer 1	Layer 1	Layer 1	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69274	4708/S/69275	4708/S/69276	
MDR Sample Date / Update	22/11/2022	22/11/2022	22/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	14.0	13.8	14.3	
Optimum Moisture Content (%)	14.0	14.0	13.0	
Variation from OMC (%)	0.0% Drier than OMC	0.0% Drier than OMC	1.0% Wetter than OMC	
Moisture Ratio (%)	**98.5**	**99.5**	**108.5**	
Density Test Results:				
Field Wet Density (t/m³)	2.13	2.16	2.14	
Field Dry Density (t/m³)	1.87	1.90	1.87	
Maximum Dry Density (t/m³)	1.88	1.87	1.87	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**99.5**	**101.5**	**100.0**	

Remarks

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Form ID: W27ASRep Rev 1

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26047-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 3 + FTG
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14872
Component:	CS Energy - FOT Area 3, FTG	Client Reference/s:	23/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	2/12/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69325	4708/S/69326	4708/S/69327	4708/S/69328
ID / Client ID	FTG	FTG	FOT	FOT
Lot Number	FOT Area 3 + FTG	FOT Area 3 + FTG	FOT Area 3 + FTG	FOT Area 3 + FTG
Date / Time Tested	23/11/2022 08:15	23/11/2022 08:32	23/11/2022 09:10	23/11/2022 09:41
Material Source	Onsite	Onsite	Onsite	Onsite
Material Type	General Fill	General Fill	General Fill	General Fill
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300
Standard or Modified	Standard	Standard	Standard	Standard
Stabilised Material Curing Time	-	-	-	-
Easting	258050.116	258051.327	258383.337	258390.088
Northing	7305466.447	730593.248	7305052.149	7305016.011
RL m	Layer 2	Layer 2	Layer 6 Top	Layer 6 Top
	FTG	FTG	Area 3 FOT	Area 3 FOT
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	0 / 0
MDR Sample Number	4708/S/69325	4708/S/69326	4708/S/69327	4708/S/69328
MDR Sample Date / Update	23/11/2022	23/11/2022	23/11/2022	23/11/2022
Assigned MDR (Yes / No)	No	No	No	No
Moisture Test Results:				
Field Moisture Content (%)	13.5	14.2	13.5	14.0
Optimum Moisture Content (%)	13.5	13.5	14.0	13.5
Variation from OMC (%)	0.0% Drier than OMC	1.0% Wetter than OMC	0.5% Drier than OMC	0.5% Wetter than OMC
Moisture Ratio (%)	**98.5**	**106.0**	**97.0**	**103.0**
Density Test Results:				
Field Wet Density (t/m³)	2.13	2.14	2.15	2.13
Field Dry Density (t/m³)	1.88	1.87	1.89	1.87
Maximum Dry Density (t/m³)	1.87	1.87	1.87	1.88
Dry Density Ratio Required (%)	95	95	95	95
Dry Density Ratio (%)	**100.0**	**100.0**	**101.0**	**99.5**

Remarks

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26051-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FTG
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14889
Component:	CS Energy - FTG Area	Client Reference/s:	25/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	2/12/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69411	4708/S/69412	4708/S/69413	
ID / Client ID	FTG	FTG	FTG	
Lot Number	FTG	FTG	FTG	
Date / Time Tested	25/11/2022 09:50	25/11/2022 10:15	25/11/2022 10:55	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258064.415	258076.084	258057.238	
Northing	7305458.127	7305482.416	7305493.342	
RL m	Layer 3	Layer 3	Layer 3	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69411	4708/S/69412	4708/S/69413	
MDR Sample Date / Update	25/11/2022	25/11/2022	25/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	12.8	12.3	12.4	
Optimum Moisture Content (%)	13.5	13.5	14.0	
Variation from OMC (%)	1.0% Drier than OMC	1.5% Drier than OMC	1.5% Drier than OMC	
Moisture Ratio (%)	**94.0**	**90.0**	**88.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.10	2.11	2.11	
Field Dry Density (t/m³)	1.86	1.88	1.88	
Maximum Dry Density (t/m³)	1.87	1.86	1.88	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**99.5**	**101.0**	**100.0**	

Remarks

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Corporate Site Number: 4708



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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/26052-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FTG
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14892
Component:	CS Energy - FTG Area	Client Reference/s:	28/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	2/12/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69433	4708/S/69434	4708/S/69435	
ID / Client ID	FTG	FTG	FTG	
Lot Number	FTG	FTG	FTG	
Date / Time Tested	28/11/2022 13:30	28/11/2022 13:40	28/11/2022 13:52	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258055.420	258070.301	258042.816	
Northing	7305454.106	7305469.224	7305488.519	
RL m	Layer 4 Top	Layer 4 Top	Layer 4 Top	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69433	4708/S/69434	4708/S/69435	
MDR Sample Date / Update	28/11/2022	28/11/2022	28/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	13.2	13.1	13.0	
Optimum Moisture Content (%)	13.5	14.0	14.5	
Variation from OMC (%)	0.5% Drier than OMC	1.0% Drier than OMC	1.5% Drier than OMC	
Moisture Ratio (%)	**97.0**	**92.5**	**91.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.10	2.10	2.09	
Field Dry Density (t/m³)	1.85	1.86	1.85	
Maximum Dry Density (t/m³)	1.86	1.86	1.84	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**99.0**	**100.0**	**100.0**	

Remarks

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Accreditation Number: 1986
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Form ID: W27ASRep Rev 1

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/25996-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 2 Trench
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14829
Component:	CS Energy - FOG Area 1	Client Reference/s:	14/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	25/11/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69249	4708/S/69250	4708/S/69251	
ID / Client ID	FOT	FOT	FOT	
Lot Number	FOT Area 2 Trench	FOT Area 2 Trench	FOT Area 2 Trench	
Date / Time Tested	14/11/2022 09:45	14/11/2022 10:00	14/11/2022 10:12	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258452.114	258449.223	258448.119	
Northing	7305033.120	7305039.042	730505.425	
RL m	Trench	Trench	Trench	
	Layer 1	Layer 1	Layer 2	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69249	4708/S/69250	4708/S/69251	
MDR Sample Date / Update	14/11/2022	14/11/2022	14/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	12.1	12.9	11.9	
Optimum Moisture Content (%)	13.5	13.5	13.5	
Variation from OMC (%)	1.5% Drier than OMC	0.5% Drier than OMC	1.5% Drier than OMC	
Moisture Ratio (%)	**88.5**	**95.5**	**89.5**	
Density Test Results:				
Field Wet Density (t/m³)	2.12	2.11	2.12	
Field Dry Density (t/m³)	1.89	1.87	1.89	
Maximum Dry Density (t/m³)	1.91	1.89	1.89	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**99.0**	**98.5**	**100.0**	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing

NATA

Accreditation Number: 1986
Corporate Site Number: 4708



Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/25997-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 1
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14830
Component:	CS Energy - FOT Area 1	Client Reference/s:	07/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	25/11/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69162	4708/S/69163	4708/S/69164	
ID / Client ID	FOT	FOT	FOT	
Lot Number	FOT Area 1	FOT Area 1	FOT Area 1	
Date / Time Tested	7/11/2022 09:55	7/11/2022 12:37	7/11/2022 14:42	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258424.239	258446.303	258426.442	
Northing	7305000.891	7305015.009	7305004.249	
RL m	Layer 1	Layer 2	Layer 2	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69162	4708/S/69163	4708/S/69164	
MDR Sample Date / Update	7/11/2022	7/11/2022	7/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	12.9	12.7	13.0	
Optimum Moisture Content (%)	12.5	13.0	14.5	
Variation from OMC (%)	0.0% Wetter than OMC	0.0% Drier than OMC	1.5% Drier than OMC	
Moisture Ratio (%)	**101.5**	**98.5**	**91.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.14	2.13	2.13	
Field Dry Density (t/m³)	1.90	1.89	1.89	
Maximum Dry Density (t/m³)	1.90	1.90	1.88	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**100.0**	**100.0**	**100.0**	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing

NATA

Accreditation Number: 1986
Corporate Site Number: 4708

Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Enviropacific Pty Ltd	Report Number:	4708/R/25998-1
Client Address:	LEVEL 5, 123 EPPING ROAD, PORT MACQUARIE PARK	Project Number:	4708/P/812
Project:	CS Energy - FOG Area 1	Lot Number:	FOT Area 1
Location:	CS Energy - Biloela, Queensland	Internal Test Request:	4708/T/14831
Component:	CS Energy - FOT Area 1	Client Reference/s:	08/11/2022 - Supervision
Area Description:	CS Energy - Biloela, Queensland.	Report Date / Page:	25/11/2022 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	4708/S/69165	4708/S/69166	4708/S/69167	
ID / Client ID	FOT	FOT	FOT	
Lot Number	FOT Area 1	FOT Area 1	FOT Area 1	
Date / Time Tested	8/11/2022 08:05	8/11/2022 10:42	8/11/2022 13:01	
Material Source	Onsite	Onsite	Onsite	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	275 / 300 / 300	275 / 300 / 300	275 / 300 / 300	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Easting	258432.290	258445.536	258423.108	
Northing	7305016.429	7305014.464	7305003.154	
RL m	Layer 3	Layer 3	Layer 3	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	
MDR Sample Number	4708/S/69165	4708/S/69166	4708/S/69167	
MDR Sample Date / Update	8/11/2022	8/11/2022	8/11/2022	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	12.0	11.8	12.2	
Optimum Moisture Content (%)	13.0	13.0	13.5	
Variation from OMC (%)	1.0% Drier than OMC	1.0% Drier than OMC	1.5% Drier than OMC	
Moisture Ratio (%)	**93.0**	**91.0**	**89.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.18	2.17	2.13	
Field Dry Density (t/m³)	1.94	1.94	1.90	
Maximum Dry Density (t/m³)	1.90	1.90	1.89	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**102.0**	**102.0**	**100.5**	

Remarks

NATA

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 1986
Corporate Site Number: 4708

Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

Appendix D

Site Photos









Located across Australia and New Zealand

QLD
Airlie
Bowen
Brisbane (Albion)
Brisbane (Beenleigh)
Brisbane (Brendale)
Brisbane (Kingston)
Brisbane (Petrie)
Cairns
Emerald
Gladstone
Gold Coast
Mackay
Moranbah
Rockhampton
Sunshine Coast
Toowoomba
Townsville

NSW
Ballina
Coffs Harbour
Marulan (Lynwood)
Newcastle
Sydney (Glendenning)
Sydney (St Peters)
Taree
Wollongong

VIC
Ararat
Bendigo
Echuca
Melbourne (Chadstone)
Melbourne (Pakenham)
Melbourne (Oaklands Junction)
Melbourne (Sunshine West)
Traralgon

WA
Bunbury
Newman
Perth
Port Hedland

SA
Adelaide
Port Augusta

NT
Darwin

ACT
Canberra

NZ
Wellington

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Construction Sciences

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MOISTURE DENSITY RELATIONSHIP REPORT

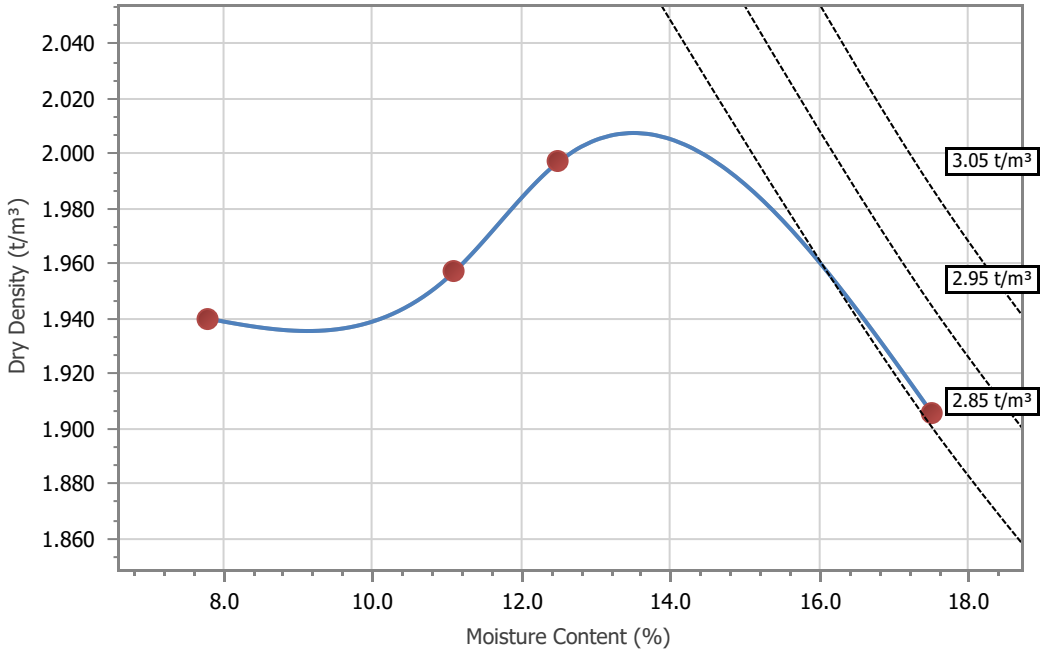
Client:	ENVIROPACIFIC SERVICES	Report Number:	2128/R/81176-1
Client Address:	1392 KINGSFORD SMITH DRIVE, PINKENBA	Project Number:	2128/P/1478
Project:	Callide Power Station	Lot Number:	Level 1
Location:	Callide Power Station	Internal Test Request:	2128/T/35302
Component:	Callide Power Station	Client Reference/s:	30/08/2023 - Site Visit
Area Description:	CS Energy - Callide Power Station	Report Date / Page:	1/09/2023 Page 1 of 1

Test Procedures	AS1289.5.1.1, AS1289.2.1.1, AS1289.1.1	Location	
Sample Number	2128/S/159270		
Sampling Method	AS1289.1.2.1 Cl 6.4b		
Date Sampled	30/08/2023		
Sampled By	Jack Lawrence	Prep Material > 53mm (%)	-
Date Tested	30/08/2023	Compactive Effort	Standard
Material Source	Onsite Material	Fraction Tested (mm)	< 19.0mm
Material Type	General Fill	Percent Oversize (%)	13
Liquid Limit Method	Estimation	Total Curing Time (hrs)	52.0
Material Description	Gravelley CLAY, Brown		

Moisture / Density Relationship Data

Moisture Content (%)	Dry Density (t/m³)
7.8	1.940
11.1	1.957
12.5	1.997
17.5	1.906

MOISTURE DENSITY RELATIONSHIP PLOT



Maximum Dry Density (t/m³):	**2.01**	**Optimum Moisture Content (%):**	**13.5**

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing

NATA

Accreditation Number: 1986
Corporate Site Number: 2128

Approved Signatory: Tai Battisson
Form ID: W4Rep Rev 3

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	ENVIROPACIFIC SERVICES	Report Number:	2128/R/81322-1
Client Address:	1392 KINGSFORD SMITH DRIVE, PINKENBA	Project Number:	2128/P/1478
Project:	Callide Power Station	Lot Number:	Level 1
Location:	Callide Power Station	Internal Test Request:	2128/T/35377
Component:	Callide Power Station - Level 1	Client Reference/s:	31/08/2023 - Level 1
Area Description:	Callide Power Station	Report Date / Page:	7/09/2023 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	2128/S/159525	2128/S/159526	2128/S/159527	
ID / Client ID	Test 1	Test 2	Test 3	
Lot Number	Level 1	Level 1	Level 1	
Date / Time Tested	31/08/2023 09:30	31/08/2023 12:03	31/08/2023 15:00	
Material Source	Onsite Material	Onsite Material	Onsite Material	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	225 / 250 / 250	225 / 250 / 250	225 / 250 / 250	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Location	E: 258060 N: 7305475 Replacement Layer 1	E: 258062 N: 7305476 Replacement Layer 2	E: 258065 N: 7305506 Layer 1	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	20 / 21	19 / 20	18 / 20	
MDR Sample Number	2128/S/159525	2128/S/159526	2128/S/159527	
MDR Sample Date / Update	31/08/2023	31/08/2023	31/08/2023	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	6.3	6.9	6.3	
Optimum Moisture Content (%)	8.5	9.0	5.0	
Variation from OMC (%)	2.5% Drier than OMC	2.0% Drier than OMC	1.0% Wetter than OMC	
Moisture Ratio (%)	**73.5**	**76.5**	**121.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.17	2.21	2.20	
Field Dry Density (t/m³)	2.04	2.07	2.07	
Maximum Dry Density (t/m³)	2.07	2.07	2.08	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**98.5**	**100.0**	**99.5**	

Remarks

NATA

Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 1986
Corporate Site Number: 2128

Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	ENVIROPACIFIC SERVICES	Report Number:	2128/R/81352-1
Client Address:	1392 KINGSFORD SMITH DRIVE, PINKENBA	Project Number:	2128/P/1478
Project:	Callide Power Station	Lot Number:	Level 1
Location:	Callide Power Station	Internal Test Request:	2128/T/35374
Component:	Callide Power Station - Level 1	Client Reference/s:	01/09/2023 - Level 1
Area Description:	Callide Power Station	Report Date / Page:	9/09/2023 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	2128/S/159517	2128/S/159518	2128/S/159519	
ID / Client ID	Test 1	Test 2	Test 3	
Lot Number	Level 1	Level 1	Level 1	
Date / Time Tested	1/09/2023 13:00	1/09/2023 13:10	1/09/2023 13:20	
Material Source	Onsite Material	Onsite Material	Onsite Material	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	225 / 250 / 250	225 / 250 / 250	225 / 250 / 250	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Location	E: 258068 N: 7305478 Layer 2	E: 258059 N: 7305476 Layer 2	E: 258055 N: 7305477 Layer 2	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	20 / 21	20 / 21	20 / 21	
MDR Sample Number	2128/S/159517	2128/S/159518	2128/S/159519	
MDR Sample Date / Update	1/09/2023	1/09/2023	1/09/2023	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	7.5	8.3	7.7	
Optimum Moisture Content (%)	10.5	10.0	10.0	
Variation from OMC (%)	3.0% Drier than OMC	2.0% Drier than OMC	2.5% Drier than OMC	
Moisture Ratio (%)	**73.0**	**82.0**	**76.0**	
Density Test Results:				
Field Wet Density (t/m³)	2.27	2.22	2.14	
Field Dry Density (t/m³)	2.11	2.05	1.99	
Maximum Dry Density (t/m³)	2.07	2.09	2.09	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**101.5**	**98.5**	**95.0**	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing

NATA

Accreditation Number: 1986
Corporate Site Number: 2128



Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

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DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	ENVIROPACIFIC SERVICES	Report Number:	2128/R/81353-1
Client Address:	1392 KINGSFORD SMITH DRIVE, PINKENBA	Project Number:	2128/P/1478
Project:	Callide Power Station	Lot Number:	Level 1
Location:	Callide Power Station	Internal Test Request:	2128/T/35376
Component:	Callide Power Station - Level 1	Client Reference/s:	02/09/2023 - Level 1
Area Description:	Callide Power Station	Report Date / Page:	9/09/2023 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.1.1, AS1289.5.8.1, AS1289.2.1.1

Sample Number	2128/S/159522	2128/S/159523	2128/S/159524	
ID / Client ID	Test 1	Test 2	Test 3	
Lot Number	Level 1	Level 1	Level 1	
Date / Time Tested	4/09/2023 09:30	4/09/2023 09:30	4/09/2023 09:30	
Material Source	Onsite Material	Onsite Material	Onsite Material	
Material Type	General Fill	General Fill	General Fill	
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	
Depths: Test / Nom / Actual (mm)	225 / 250 / 250	225 / 250 / 250	225 / 250 / 250	
Standard or Modified	Standard	Standard	Standard	
Stabilised Material Curing Time	-	-	-	
Location	E: 258071 N: 7305493 Layer 3	E: 258060 N: 7305485 Layer 3	E: 258056 N: 7305485 Layer 3	
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	
Sample Oversize Wet / Dry (%)	19 / 21	20 / 21	19 / 20	
MDR Sample Number	2128/S/159522	2128/S/159523	2128/S/159524	
MDR Sample Date / Update	4/09/2023	4/09/2023	4/09/2023	
Assigned MDR (Yes / No)	No	No	No	
Moisture Test Results:				
Field Moisture Content (%)	7.4	7.2	6.2	
Optimum Moisture Content (%)	10.0	8.0	8.0	
Variation from OMC (%)	2.5% Drier than OMC	1.0% Drier than OMC	2.0% Drier than OMC	
Moisture Ratio (%)	**74.5**	**89.0**	**77.5**	
Density Test Results:				
Field Wet Density (t/m³)	2.20	2.21	2.22	
Field Dry Density (t/m³)	2.05	2.06	2.09	
Maximum Dry Density (t/m³)	2.04	2.07	2.07	
Dry Density Ratio Required (%)	95	95	95	
Dry Density Ratio (%)	**100.5**	**99.5**	**101.0**	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing

NATA

Accreditation Number: 1986
Corporate Site Number: 2128



Approved Signatory: Tai Battisson
Form ID: W27ASRep Rev 1

APPENDIX Q SOIL REMEDIATION AND VALIDATION ANALYTICAL RESULTS

epic ENVIRONMENTAL

Chain of Custody Record

| | | |

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IANZ# 1290

Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Luke Amies
Project name:	CALLIDE
Project ID:	BCL220033.01
Turnaround time:	5 Day
Date/Time received	Oct 10, 2022 4:30 PM
Eurofins reference	930684

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Luke Amies - lamies@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

eurofins

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email: EnviroSales@eurofins.com

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Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Project Name: CALLIDE
Project ID: BCL220033.01

Order No.:
Report #: 930684
Phone: 0400 497 512
Fax:

Received: Oct 10, 2022 4:30 PM
Due: Oct 17, 2022
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SD01_0410	Apr 10, 2022		Rock	B22-Oc0019449	X	X
2	SD02_0410	Apr 10, 2022		Soil	B22-Oc0019450	X	X
3	SD03_0410	Apr 10, 2022		Soil	B22-Oc0019451	X	X
4	SD04_0410	Apr 10, 2022		Soil	B22-Oc0019452	X	X
5	SD05_0410	Apr 10, 2022		Soil	B22-Oc0019453	X	X
6	SD06_0410	Apr 10, 2022		Soil	B22-Oc0019454	X	X
Test Counts						6	6

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Luke Amies**

Report **930684-S**
Project name CALLIDE
Project ID BCL220033.01
Received Date Oct 10, 2022

Client Sample ID			**SD01_0410**	**SD02_0410**	**SD03_0410**	**SD04_0410**
Sample Matrix			**Rock**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Oc0019449**	**B22-Oc0019450**	**B22-Oc0019451**	**B22-Oc0019452**
Date Sampled			**Apr 10, 2022**	**Apr 10, 2022**	**Apr 10, 2022**	**Apr 10, 2022**
Test/Reference	LOR	Unit				
% Moisture	1	%	3.1	7.2	8.7	10
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	106	86	101	96
13C5-PFPeA (surr.)	1	%	95	84	120	130
13C5-PFHxA (surr.)	1	%	114	99	106	112
13C4-PFHpA (surr.)	1	%	113	95	100	94
13C8-PFOA (surr.)	1	%	116	94	102	102
13C5-PFNA (surr.)	1	%	108	95	106	112
13C6-PFDA (surr.)	1	%	119	109	113	117
13C2-PFUnDA (surr.)	1	%	134	133	140	133
13C2-PFDoDA (surr.)	1	%	132	123	120	130
13C2-PFTeDA (surr.)	1	%	115	118	102	107
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			SD01_0410	SD02_0410	SD03_0410	SD04_0410
Sample Matrix			Rock	Soil	Soil	Soil
Eurofins Sample No.			B22-Oc0019449	B22-Oc0019450	B22-Oc0019451	B22-Oc0019452
Date Sampled			Apr 10, 2022	Apr 10, 2022	Apr 10, 2022	Apr 10, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	88	87	86	88
D3-N-MeFOSA (surr.)	1	%	117	104	113	107
D5-N-EtFOSA (surr.)	1	%	141	132	140	135
D7-N-MeFOSE (surr.)	1	%	100	89	100	94
D9-N-EtFOSE (surr.)	1	%	82	78	82	85
D5-N-EtFOSAA (surr.)	1	%	91	75	86	76
D3-N-MeFOSAA (surr.)	1	%	105	90	98	94
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]6.4	< 5	< 5	[N09]5.7
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]210	[N09]18	[N09]17	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	116	114	121	110
18O2-PFHxS (surr.)	1	%	111	109	113	105
13C8-PFOS (surr.)	1	%	77	89	99	98
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	119	125	141	128
13C2-6:2 FTSA (surr.)	1	%	120	118	105	108
13C2-8:2 FTSA (surr.)	1	%	99	88	93	96
13C2-10:2 FTSA (surr.)	1	%	82	87	82	83
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	216.4	18	17	5.7
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	210	18	17	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	216.4	18	17	5.7
Sum of WA DWER PFAS (n=10)*	10	ug/kg	216.4	18	17	< 10
Sum of PFASs (n=30)*	50	ug/kg	216.4	< 50	< 50	< 50

Client Sample ID			SD05_0410	SD06_0410
Sample Matrix			Soil	Soil
Eurofins Sample No.			B22-Oc0019453	B22-Oc0019454
Date Sampled			Apr 10, 2022	Apr 10, 2022
Test/Reference	LOR	Unit		
% Moisture	1	%	6.9	6.6
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	[N09]5.9
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	82	75
13C5-PFPeA (surr.)	1	%	95	79
13C5-PFHxA (surr.)	1	%	93	83
13C4-PFHpA (surr.)	1	%	91	82
13C8-PFOA (surr.)	1	%	107	90
13C5-PFNA (surr.)	1	%	93	98
13C6-PFDA (surr.)	1	%	108	102
13C2-PFUnDA (surr.)	1	%	123	118
13C2-PFDoDA (surr.)	1	%	126	124
13C2-PFTeDA (surr.)	1	%	102	107
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10
13C8-FOSA (surr.)	1	%	86	84
D3-N-MeFOSA (surr.)	1	%	108	108
D5-N-EtFOSA (surr.)	1	%	134	122
D7-N-MeFOSE (surr.)	1	%	95	90
D9-N-EtFOSE (surr.)	1	%	84	76
D5-N-EtFOSAA (surr.)	1	%	73	66
D3-N-MeFOSAA (surr.)	1	%	79	80
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	[N09]13
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5

Client Sample ID			SD05_0410	SD06_0410
Sample Matrix			Soil	Soil
Eurofins Sample No.			B22-Oc0019453	B22-Oc0019454
Date Sampled			Apr 10, 2022	Apr 10, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	[N09]29
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	[N09]6.1
13C3-PFBS (surr.)	1	%	107	108
18O2-PFHxS (surr.)	1	%	104	102
13C8-PFOS (surr.)	1	%	83	96
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	7.1	5.3
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	129	133
13C2-6:2 FTSA (surr.)	1	%	104	122
13C2-8:2 FTSA (surr.)	1	%	82	89
13C2-10:2 FTSA (surr.)	1	%	80	86
PFASs Summations				
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	42
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	34.9
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	47.9
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	53.2
Sum of PFASs (n=30)*	50	ug/kg	< 50	59.3

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Brisbane	Oct 12, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Oct 13, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Oct 13, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Oct 13, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Oct 13, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Received: Oct 10, 2022 4:30 PM
Due: Oct 17, 2022
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SD01_0410	Apr 10, 2022		Rock	B22-Oc0019449	X	X
2	SD02_0410	Apr 10, 2022		Soil	B22-Oc0019450	X	X
3	SD03_0410	Apr 10, 2022		Soil	B22-Oc0019451	X	X
4	SD04_0410	Apr 10, 2022		Soil	B22-Oc0019452	X	X
5	SD05_0410	Apr 10, 2022		Soil	B22-Oc0019453	X	X
6	SD06_0410	Apr 10, 2022		Soil	B22-Oc0019454	X	X
Test Counts						6	6

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	87			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	100			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	90			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	93			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	85			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	93			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	82			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	95			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	102			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	102			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	96			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	96			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	107			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	98			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	99			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	81			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	89			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	94			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	89			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	122			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	80			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	96			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	87			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	102			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	110			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	103			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B22-Oc0017635	NCP	%	87			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Oc0017635	NCP	%	94			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Oc0017635	NCP	%	101			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Oc0017635	NCP	%	94			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-Oc0017635	NCP	%	91			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-Oc0017635	NCP	%	103			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-Oc0017635	NCP	%	82			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Oc0017635	NCP	%	89			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-Oc0017635	NCP	%	96			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-Oc0017635	NCP	%	95			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-Oc0017635	NCP	%	93			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-Oc0017635	NCP	%	99			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Oc0017635	NCP	%	94			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Oc0017635	NCP	%	96			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Oc0017635	NCP	%	100			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Oc0017635	NCP	%	88			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Oc0017635	NCP	%	91			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Oc0017635	NCP	%	102			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-Oc0017635	NCP	%	86			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Oc0017635	NCP	%	135			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Oc0017635	NCP	%	86			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Oc0017635	NCP	%	80			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Oc0017635	NCP	%	99			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-Oc0017635	NCP	%	85			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Oc0017635	NCP	%	104			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-Oc0017635	NCP	%	113			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Oc0017635	NCP	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Oc0017635	NCP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Oc0017635	NCP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Oc0017635	NCP	%	103			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Oc0019613	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Oc0019613	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Oc0019613	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Oc0019613	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B22-Oc0019454	CP	%	6.6	8.9	30	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Chain of Custody Record

| | | |

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Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Luke Amies
Project name:	CALLIDE
Project ID:	BCL220033.01
Turnaround time:	5 Day
Date/Time received	Oct 12, 2022 4:35 PM
Eurofins reference	931113

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Luke Amies - lamies@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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Brisbane
QLD 4000

Project Name: CALLIDE
Project ID: BCL220033.01

Order No.:
Report #: 931113
Phone: 0400 497 512
Fax:

Received: Oct 12, 2022 4:35 PM
Due: Oct 19, 2022
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SD01-0610	Oct 06, 2022		Soil	B22-Oc0022100	X	X
2	SD02-0610	Oct 06, 2022		Soil	B22-Oc0022101	X	X
3	SD03-0610	Oct 06, 2022		Soil	B22-Oc0022102	X	X
Test Counts						3	3

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Luke Amies**

Report **931113-S**
Project name CALLIDE
Project ID BCL220033.01
Received Date Oct 12, 2022

Client Sample ID			**SD01-0610**	**SD02-0610**	**SD03-0610**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-Oc0022100**	**B22-Oc0022101**	**B22-Oc0022102**
Date Sampled			**Oct 06, 2022**	**Oct 06, 2022**	**Oct 06, 2022**
Test/Reference	LOR	Unit			
% Moisture	1	%	14	5.7	4.4
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	90	92	94
13C5-PFPeA (surr.)	1	%	81	82	105
13C5-PFHxA (surr.)	1	%	81	84	82
13C4-PFHpA (surr.)	1	%	80	83	78
13C8-PFOA (surr.)	1	%	88	92	96
13C5-PFNA (surr.)	1	%	84	94	94
13C6-PFDA (surr.)	1	%	134	142	146
13C2-PFUnDA (surr.)	1	%	138	147	145
13C2-PFDoDA (surr.)	1	%	117	123	129
13C2-PFTeDA (surr.)	1	%	96	103	96
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10

Client Sample ID			SD01-0610	SD02-0610	SD03-0610
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			B22-Oc0022100	B22-Oc0022101	B22-Oc0022102
Date Sampled			Oct 06, 2022	Oct 06, 2022	Oct 06, 2022
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
13C8-FOSA (surr.)	1	%	87	86	93
D3-N-MeFOSA (surr.)	1	%	94	98	93
D5-N-EtFOSA (surr.)	1	%	93	94	98
D7-N-MeFOSE (surr.)	1	%	94	98	104
D9-N-EtFOSE (surr.)	1	%	102	114	118
D5-N-EtFOSAA (surr.)	1	%	112	131	146
D3-N-MeFOSAA (surr.)	1	%	79	82	90
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]11	[N09]36	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]1700	[N09]57	[N09]63
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	110	104	100
18O2-PFHxS (surr.)	1	%	101	102	111
13C8-PFOS (surr.)	1	%	87	95	100
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	84	86	90
13C2-6:2 FTSA (surr.)	1	%	74	75	77
13C2-8:2 FTSA (surr.)	1	%	93	91	96
13C2-10:2 FTSA (surr.)	1	%	91	92	98
PFASs Summations					
Sum (PFHxS + PFOS)*	5	ug/kg	1711	93	63
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	1700	57	63
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	1711	93	63
Sum of WA DWER PFAS (n=10)*	10	ug/kg	1711	93	63
Sum of PFASs (n=30)*	50	ug/kg	1711	93	63

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Brisbane	Oct 12, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Oct 17, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Oct 17, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Oct 17, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Oct 17, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Address: Level 17, 95 North Quay
Brisbane
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Project Name: CALLIDE
Project ID: BCL220033.01

Order No.:
Report #: 931113
Phone: 0400 497 512
Fax:

Received: Oct 12, 2022 4:35 PM
Due: Oct 19, 2022
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SD01-0610	Oct 06, 2022		Soil	B22-Oc0022100	X	X
2	SD02-0610	Oct 06, 2022		Soil	B22-Oc0022101	X	X
3	SD03-0610	Oct 06, 2022		Soil	B22-Oc0022102	X	X
Test Counts						3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	84			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	74			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	89			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	99			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	92			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	79			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	96			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	97			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	87			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	104			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	88			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	89			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	99			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	96			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	94			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	84			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	82			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	80			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	78			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	120			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	74			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	78			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	88			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	107			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	95			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	95			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	85			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B22-Oc0025914	NCP	%	106			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Oc0025914	NCP	%	106			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Oc0025914	NCP	%	125			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Oc0025914	NCP	%	115			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-Oc0025914	NCP	%	70			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-Oc0025914	NCP	%	98			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-Oc0025914	NCP	%	92			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Oc0025914	NCP	%	95			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-Oc0025914	NCP	%	93			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-Oc0025914	NCP	%	94			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-Oc0025914	NCP	%	87			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-Oc0025914	NCP	%	82			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Oc0025914	NCP	%	103			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Oc0025914	NCP	%	94			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Oc0025914	NCP	%	96			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Oc0025914	NCP	%	90			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Oc0025914	NCP	%	87			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Oc0025914	NCP	%	96			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-Oc0025914	NCP	%	110			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Oc0025914	NCP	%	119			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Oc0025914	NCP	%	78			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Oc0025914	NCP	%	124			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Oc0025914	NCP	%	N/A			50-150	Fail	Q05
Perfluoroheptanesulfonic acid (PFHpS)	B22-Oc0025914	NCP	%	141			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Oc0025914	NCP	%	N/A			50-150	Fail	Q05
Perfluorodecanesulfonic acid (PFDS)	B22-Oc0025914	NCP	%	119			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Oc0025914	NCP	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Oc0025914	NCP	%	103			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Oc0025914	NCP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Oc0025914	NCP	%	92			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B22-Oc0020727	NCP	%	9.4	11	14	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-Oc0022101	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-Oc0022101	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-Oc0022101	CP	ug/kg	36	46	24	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-Oc0022101	CP	ug/kg	57	65	13	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-Oc0022101	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-Oc0022101	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
Q05	The matrix spike concentration is less than five times the background concentration in the sample - therefore the spike recovery cannot be determined

Authorised by:

Alana Wadsworth	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

epic ENVIRONMENTAL

Chain of Custody Record

Project No:	BCL2200033.01
Project/Site:	CALLIDE
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au)
Phone:	#REF!
Page:	1 OF 2
Number of Eskies:	6 ESKIES

Lab:	Eurofins
Lab Quote No:	
Lab Batch No:	
Date Results Required:	
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other	pH	EC	TDS - Standard	Suspended Solids	Ammonia, Nitrate and Nitrite	Reactive P	Major Cations/Anions	PFAS Ultra Low Level	Total PFAS - 28 Analyte	HOLD
	SD09_2810	28/10/2022 0:00	SOIL				x										x	
	SD10_2810	28/10/2022 0:00	SOIL				x										x	
	SD11_2810	28/10/2022 0:00	SOIL				x											
	SD01_2710	27/10/2022 0:00	SOIL				x										x	
	SD02_2710	27/10/2022 0:00	SOIL				x										x	
	SD03_2710	27/10/2022 0:00	SOIL				x										x	
	SD04_2710	27/10/2022 0:00	SOIL				x										x	
	SD05_2710	27/10/2022 0:00	SOIL				x										x	
	SD06_2710	27/10/2022 0:00	SOIL				x										x	
	SD07_2710	27/10/2022 0:00	SOIL				x										x	
	SD08_2710	27/10/2022 0:00	SOIL				x										x	

Relinquished By:

NAME: SP | SIGNATURE | DATE: 2/11/22

31-Oct-22

Received By

SIGNATURE | DATE

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES:

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au

2/11/22 3:10pm
8.0
0.2
7.8

937342

www.eurofins.com.au EnviroSales@eurofins.com

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IANZ# 1327

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Rolleston,
Christchurch 7675
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Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Luke Amies
Project name:	CALLIDE
Project ID:	BCL2200033.01
Turnaround time:	5 Day
Date/Time received	Nov 2, 2022 3:10 PM
Eurofins reference	937342

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Luke Amies - lamies@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Project Name: CALLIDE
Project ID: BCL2200033.01

Order No.:
Report #: 937342
Phone: 0400 497 512
Fax:

Received: Nov 2, 2022 3:10 PM
Due: Nov 9, 2022
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	SD09_2810	Oct 28, 2022		Soil	B22-No0005030		X	X
2	SD10_2810	Oct 28, 2022		Soil	B22-No0005031		X	X
3	SD01_2710	Oct 27, 2022		Soil	B22-No0005032		X	X
4	SD02_2710	Oct 27, 2022		Soil	B22-No0005033		X	X
5	SD03_2710	Oct 27, 2022		Soil	B22-No0005034		X	X
6	SD04_2710	Oct 27, 2022		Soil	B22-No0005035		X	X
7	SD05_2710	Oct 27, 2022		Soil	B22-No0005036		X	X
8	SD06_2710	Oct 27, 2022		Soil	B22-No0005037		X	X
9	SD07_2710	Oct 27, 2022		Soil	B22-No0005038		X	X
10	SD08_2710	Oct 27, 2022		Soil	B22-No0005039		X	X
11	SD11_2810	Oct 28, 2022		Soil	B22-No0005040	X		
Test Counts						1	10	10

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Luke Amies**

Report **937342-S**
Project name CALLIDE
Project ID BCL2200033.01
Received Date Nov 02, 2022

Client Sample ID			**SD09_2810**	**SD10_2810**	**SD01_2710**	**SD02_2710**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B22-No0005030**	**B22-No0005031**	**B22-No0005032**	**B22-No0005033**
Date Sampled			**Oct 28, 2022**	**Oct 28, 2022**	**Oct 27, 2022**	**Oct 27, 2022**
Test/Reference	LOR	Unit				
% Moisture	1	%	8.7	12	11	16
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	119	115	90	85
13C5-PFPeA (surr.)	1	%	107	114	102	91
13C5-PFHxA (surr.)	1	%	96	111	96	94
13C4-PFHpA (surr.)	1	%	105	88	96	84
13C8-PFOA (surr.)	1	%	109	98	91	86
13C5-PFNA (surr.)	1	%	117	113	95	96
13C6-PFDA (surr.)	1	%	125	122	131	130
13C2-PFUnDA (surr.)	1	%	107	103	133	126
13C2-PFDoDA (surr.)	1	%	108	105	133	118
13C2-PFTeDA (surr.)	1	%	119	109	113	110
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			SD09_2810	SD10_2810	SD01_2710	SD02_2710
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B22-No0005030	B22-No0005031	B22-No0005032	B22-No0005033
Date Sampled			Oct 28, 2022	Oct 28, 2022	Oct 27, 2022	Oct 27, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	102	101	93	85
D3-N-MeFOSA (surr.)	1	%	118	99	145	127
D5-N-EtFOSA (surr.)	1	%	108	109	89	79
D7-N-MeFOSE (surr.)	1	%	117	108	91	85
D9-N-EtFOSE (surr.)	1	%	88	96	90	95
D5-N-EtFOSAA (surr.)	1	%	99	95	122	119
D3-N-MeFOSAA (surr.)	1	%	101	98	142	124
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]68	< 5	[N09]190	[N09]17
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	111	94	102	100
18O2-PFHxS (surr.)	1	%	102	103	107	101
13C8-PFOS (surr.)	1	%	80	99	90	104
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	96	106	109	101
13C2-6:2 FTSA (surr.)	1	%	125	111	96	70
13C2-8:2 FTSA (surr.)	1	%	118	110	108	113
13C2-10:2 FTSA (surr.)	1	%	105	100	106	104
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	68	< 5	190	17
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	68	< 5	190	17
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	68	< 5	190	17
Sum of WA DWER PFAS (n=10)*	10	ug/kg	68	< 10	190	17
Sum of PFASs (n=30)*	50	ug/kg	68	< 50	190	< 50

Client Sample ID			SD03_2710	SD04_2710	SD05_2710	SD06_2710
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B22-No0005034	B22-No0005035	B22-No0005036	B22-No0005037
Date Sampled			Oct 27, 2022	Oct 27, 2022	Oct 27, 2022	Oct 27, 2022
Test/Reference	LOR	Unit				
% Moisture	1	%	12	7.2	7.8	9.2
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	86	87	98	100
13C5-PFPeA (surr.)	1	%	97	97	90	91
13C5-PFHxA (surr.)	1	%	96	101	90	86
13C4-PFHpA (surr.)	1	%	93	91	93	91
13C8-PFOA (surr.)	1	%	92	90	86	80
13C5-PFNA (surr.)	1	%	97	97	89	87
13C6-PFDA (surr.)	1	%	129	128	95	88
13C2-PFUnDA (surr.)	1	%	133	139	87	83
13C2-PFDoDA (surr.)	1	%	124	132	92	88
13C2-PFTeDA (surr.)	1	%	105	116	93	91
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	91	92	99	98
D3-N-MeFOSA (surr.)	1	%	134	150	96	97
D5-N-EtFOSA (surr.)	1	%	85	87	105	102
D7-N-MeFOSE (surr.)	1	%	90	93	90	92
D9-N-EtFOSE (surr.)	1	%	87	93	109	107
D5-N-EtFOSAA (surr.)	1	%	110	124	100	95
D3-N-MeFOSAA (surr.)	1	%	127	130	98	94
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			SD03_2710	SD04_2710	SD05_2710	SD06_2710
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B22-No0005034	B22-No0005035	B22-No0005036	B22-No0005037
Date Sampled			Oct 27, 2022	Oct 27, 2022	Oct 27, 2022	Oct 27, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]110	[N09]6.9	[N09]26	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	104	109	113	118
18O2-PFHxS (surr.)	1	%	112	112	101	99
13C8-PFOS (surr.)	1	%	108	106	80	90
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	98	122	99	94
13C2-6:2 FTSA (surr.)	1	%	82	92	109	100
13C2-8:2 FTSA (surr.)	1	%	104	112	97	86
13C2-10:2 FTSA (surr.)	1	%	104	103	94	92
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	110	6.9	26	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	110	6.9	26	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	110	6.9	26	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	110	< 10	26	< 10
Sum of PFASs (n=30)*	50	ug/kg	110	< 50	< 50	< 50

Client Sample ID			SD07_2710	SD08_2710
Sample Matrix			Soil	Soil
Eurofins Sample No.			B22-No0005038	B22-No0005039
Date Sampled			Oct 27, 2022	Oct 27, 2022
Test/Reference	LOR	Unit		
% Moisture	1	%	13	5.4
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	99	100
13C5-PFPeA (surr.)	1	%	93	87
13C5-PFHxA (surr.)	1	%	94	75
13C4-PFHpA (surr.)	1	%	78	82

Client Sample ID			SD07_2710	SD08_2710
Sample Matrix			Soil	Soil
Eurofins Sample No.			B22-No0005038	B22-No0005039
Date Sampled			Oct 27, 2022	Oct 27, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
13C8-PFOA (surr.)	1	%	71	76
13C5-PFNA (surr.)	1	%	81	80
13C6-PFDA (surr.)	1	%	67	86
13C2-PFUnDA (surr.)	1	%	72	78
13C2-PFDoDA (surr.)	1	%	79	85
13C2-PFTeDA (surr.)	1	%	79	85
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10
13C8-FOSA (surr.)	1	%	92	91
D3-N-MeFOSA (surr.)	1	%	85	96
D5-N-EtFOSA (surr.)	1	%	99	99
D7-N-MeFOSE (surr.)	1	%	84	90
D9-N-EtFOSE (surr.)	1	%	97	89
D5-N-EtFOSAA (surr.)	1	%	89	84
D3-N-MeFOSAA (surr.)	1	%	86	90
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]850	[N09]43
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5
13C3-PFBS (surr.)	1	%	98	110
18O2-PFHxS (surr.)	1	%	89	95
13C8-PFOS (surr.)	1	%	106	75
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	91	72
13C2-6:2 FTSA (surr.)	1	%	92	94
13C2-8:2 FTSA (surr.)	1	%	78	79
13C2-10:2 FTSA (surr.)	1	%	83	88

Client Sample ID			SD07_2710	SD08_2710
Sample Matrix			Soil	Soil
Eurofins Sample No.			B22-No0005038	B22-No0005039
Date Sampled			Oct 27, 2022	Oct 27, 2022
Test/Reference	LOR	Unit		
PFASs Summations				
Sum (PFHxS + PFOS)*	5	ug/kg	850	43
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	850	43
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	850	43
Sum of WA DWER PFAS (n=10)*	10	ug/kg	850	43
Sum of PFASs (n=30)*	50	ug/kg	850	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Brisbane	Nov 02, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Nov 07, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Project Name: CALLIDE
Project ID: BCL2200033.01

Order No.:
Report #: 937342
Phone: 0400 497 512
Fax:

Received: Nov 2, 2022 3:10 PM
Due: Nov 9, 2022
Priority: 5 Day
Contact Name: Luke Amies

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	SD09_2810	Oct 28, 2022		Soil	B22-No0005030		X	X
2	SD10_2810	Oct 28, 2022		Soil	B22-No0005031		X	X
3	SD01_2710	Oct 27, 2022		Soil	B22-No0005032		X	X
4	SD02_2710	Oct 27, 2022		Soil	B22-No0005033		X	X
5	SD03_2710	Oct 27, 2022		Soil	B22-No0005034		X	X
6	SD04_2710	Oct 27, 2022		Soil	B22-No0005035		X	X
7	SD05_2710	Oct 27, 2022		Soil	B22-No0005036		X	X
8	SD06_2710	Oct 27, 2022		Soil	B22-No0005037		X	X
9	SD07_2710	Oct 27, 2022		Soil	B22-No0005038		X	X
10	SD08_2710	Oct 27, 2022		Soil	B22-No0005039		X	X
11	SD11_2810	Oct 28, 2022		Soil	B22-No0005040	X		
Test Counts						1	10	10

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	106			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	119			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	100			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	96			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	110			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	97			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	117			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	107			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	116			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	128			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	72			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	104			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	82			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	98			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	71			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	123			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	110			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	76			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	88			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	88			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	62			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	91			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	88			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	78			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	102			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	111			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	135			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B22-No0005037	CP	%	117			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0005037	CP	%	108			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0005037	CP	%	126			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0005037	CP	%	97			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0005037	CP	%	98			50-150	Pass	
Perfluorononanoic acid (PFNA)	B22-No0005037	CP	%	112			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0005037	CP	%	99			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0005037	CP	%	125			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0005037	CP	%	111			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0005037	CP	%	111			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0005037	CP	%	136			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B22-No0005037	CP	%	77			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0005037	CP	%	119			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0005037	CP	%	75			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0005037	CP	%	106			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0005037	CP	%	89			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0005037	CP	%	117			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0005037	CP	%	115			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B22-No0005037	CP	%	73			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0005037	CP	%	92			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0005037	CP	%	90			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0005037	CP	%	57			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0005037	CP	%	99			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0005037	CP	%	91			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0005037	CP	%	103			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0005037	CP	%	70			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0005037	CP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0005037	CP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0005037	CP	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0005037	CP	%	144			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-No0005036	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-No0005036	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-No0005036	CP	ug/kg	26	25	4.3	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-No0005036	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-No0005036	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

From: Michael Kowalczyk <mkowalczyk@epicenvironmental.com.au>
Sent: Tuesday, 6 December 2022 9:23 AM
To: Kimberly HiltonBarber <k.hiltonbarber@ALSGlobal.com>
Cc: ALSEnviro Brisbane <ALSEnviro.Brisbane@alsglobal.com>
Subject: [EXTERNAL] - RE: SRN for ALS Workorder : EB2236355 | Your Reference: BCL220033.01 CALLIDE

CAUTION: This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Thank you for getting this arranged,

Thank you for your time on the phone. As discussed, would I also be able to get the following samples currently on hold with ALS **forwarded to Eurofins** with a request for ASLP PFAS testing (pH 7):

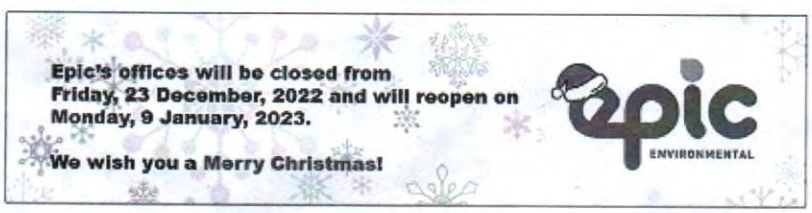
- FOT A1 SP1 TREATED EPIC
- FOT A1 SP2 TREATED EPIC
- FOT A1 SP5 TREATED EPIC

I acknowledge the additional charges associated with this.

Regards,
Michael

Michael Kowalczyk
Project Environmental Scientist

Mobile: 0447 300 420
Email: mkowalczyk@epicenvironmental.com.au



Date/Time: 7/12/22 2:50pm
Chilled: Yes No
Temp: 2.1
Correction: -0.2
Final temp: 1.9°C

#948249

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

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Sample Receipt Advice

Company name:	Epic Environmental Pty Ltd
Contact name:	Michael Kowalczyk
Project name:	Not provided
Project ID:	BCL220033.01
Turnaround time:	5 Day
Date/Time received	Dec 7, 2022 2:50 PM
Eurofins reference	948249

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
X	Split sample sent to requested external lab.
X	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Alana Wadsworth on phone : 0499 810 009 or by email: AlanaWadsworth@eurofins.com

Results will be delivered electronically via email to Michael Kowalczyk - mkowalczyk@epicenvironmental.com.au.

Note: A copy of these results will also be delivered to the general Epic Environmental Pty Ltd email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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Rolleston,
Christchurch 7675
Tel: 0800 856 450
IANZ# 1290

Company Name: Epic Environmental Pty Ltd
Address: Level 17, 95 North Quay
Brisbane
QLD 4000

Project Name:
Project ID: BCL220033.01

Order No.:
Report #: 948249
Phone: 0400 497 512
Fax:

Received: Dec 7, 2022 2:50 PM
Due: Dec 14, 2022
Priority: 5 Day
Contact Name: Michael Kowalczyk

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A1 SP1 TREATED EPIC	Nov 04, 2022		AUS Leachate - Reagent Water	B22-De0017155	X	X
2	FOT A1 SP2 TREATED EPIC	Nov 04, 2022		AUS Leachate - Reagent Water	B22-De0017156	X	X
3	FOT A1 SP5 TREATED EPIC	Nov 04, 2022		AUS Leachate - Reagent Water	B22-De0017157	X	X
Test Counts						3	3

Epic Environmental Pty Ltd
Level 17, 95 North Quay
Brisbane
QLD 4000

NATA Accredited
Accreditation Number 1261
Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Michael Kowalczyk**

Report **948249-L**
Project name
Project ID BCL220033.01
Received Date Dec 07, 2022

Client Sample ID			**FOT A1 SP1 TREATED EPIC**	**FOT A1 SP2 TREATED EPIC**	**FOT A1 SP5 TREATED EPIC**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**B22-De0017155**	**B22-De0017156**	**B22-De0017157**
Date Sampled			**Nov 04, 2022**	**Nov 04, 2022**	**Nov 04, 2022**
Test/Reference	LOR	Unit			
AUS Leaching Procedure					
Leachate Fluid[C01]		comment	4.0	4.0	4.0
pH (initial)	0.1	pH Units	N/A	N/A	N/A
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0
pH (off)	0.1	pH Units	9.3	9.1	9.3
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	80	102	52
13C5-PFPeA (surr.)	1	%	59	98	43
13C5-PFHxA (surr.)	1	%	80	102	55
13C4-PFHpA (surr.)	1	%	90	115	53
13C8-PFOA (surr.)	1	%	79	128	52
13C5-PFNA (surr.)	1	%	71	101	43
13C6-PFDA (surr.)	1	%	67	89	36
13C2-PFUnDA (surr.)	1	%	60	80	33
13C2-PFDoDA (surr.)	1	%	47	66	27
13C2-PFTeDA (surr.)	1	%	36	48	16

Client Sample ID			FOT A1 SP1 TREATED EPIC	FOT A1 SP2 TREATED EPIC	FOT A1 SP5 TREATED EPIC
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			B22-De0017155	B22-De0017156	B22-De0017157
Date Sampled			Nov 04, 2022	Nov 04, 2022	Nov 04, 2022
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	61	82	34
D3-N-MeFOSA (surr.)	1	%	42	55	20
D5-N-EtFOSA (surr.)	1	%	35	47	16
D7-N-MeFOSE (surr.)	1	%	22	32	12
D9-N-EtFOSE (surr.)	1	%	24	32	11
D5-N-EtFOSAA (surr.)	1	%	49	69	26
D3-N-MeFOSAA (surr.)	1	%	52	68	30
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]0.06	[N09]0.09	[N09]0.09
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	60	106	40
18O2-PFHxS (surr.)	1	%	88	129	56
13C8-PFOS (surr.)	1	%	78	106	117
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	60	88	37
13C2-6:2 FTSA (surr.)	1	%	70	120	56
13C2-8:2 FTSA (surr.)	1	%	67	94	33
13C2-10:2 FTSA (surr.)	1	%	58	79	30
PFASs Summations					
Sum (PFHxS + PFOS)*	0.01	ug/L	0.06	0.09	0.09
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.06	0.09	0.09
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.06	0.09	0.09
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.06	0.09	0.09
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
AUS Leaching Procedure	Brisbane	Dec 12, 2022	7 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Dec 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Dec 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Dec 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Dec 12, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Phone: 0400 497 512
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Received: Dec 7, 2022 2:50 PM
Due: Dec 14, 2022
Priority: 5 Day
Contact Name: Michael Kowalczyk

Eurofins Analytical Services Manager : Alana Wadsworth

Sample Detail						AUS Leaching Procedure	Per- and Polyfluoroalkyl Substances (PFASs)
Brisbane Laboratory - NATA # 1261 Site # 20794						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FOT A1 SP1 TREATED EPIC	Nov 04, 2022		AUS Leachate - Reagent Water	B22-De0017155	X	X
2	FOT A1 SP2 TREATED EPIC	Nov 04, 2022		AUS Leachate - Reagent Water	B22-De0017156	X	X
3	FOT A1 SP5 TREATED EPIC	Nov 04, 2022		AUS Leachate - Reagent Water	B22-De0017157	X	X
Test Counts						3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B22-De0017157	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B22-De0017157	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B22-De0017157	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B22-De0017157	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	B22-De0017157	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	B22-De0017157	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B22-De0017157	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B22-De0017157	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	B22-De0017157	CP	ug/L	0.09	0.09	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	B22-De0017157	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B22-De0017157	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Alana Wadsworth	Analytical Services Manager
Jonathon Angell	Senior Analyst-PFAS
Jonathon Angell	Senior Analyst-Sample Properties



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2229393**	Page	: 1 of 5
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 11-Oct-2022 12:20
Order number	: ----	Date Analysis Commenced	: 12-Oct-2022
C-O-C number	: ----	Issue Date	: 21-Oct-2022 16:41
Sampler	: LUKE AMIES		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X PFAS: The LOR of PFOS for sample “CR05” has been raised due to sample matrix interferences.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	CR01	CR02	CR03	CR04	CR05
			Sampling date / time	05-Oct-2022 00:00	05-Oct-2022 00:00	05-Oct-2022 00:00	05-Oct-2022 00:00	05-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2229393-001	EB2229393-002	EB2229393-003	EB2229393-004	EB2229393-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**8.3**	**8.9**	**9.1**	**6.3**	**7.7**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0009**	<0.0002	<0.0002	<0.0002	**0.0002**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0006**	<0.0002	<0.0002	<0.0002	<0.0003
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	CR01	CR02	CR03	CR04	CR05
				Sampling date / time	05-Oct-2022 00:00	05-Oct-2022 00:00	05-Oct-2022 00:00	05-Oct-2022 00:00	05-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229393-001	EB2229393-002	EB2229393-003	EB2229393-004	EB2229393-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0015**	<0.0002	<0.0002	<0.0002	**0.0002**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0015**	<0.0002	<0.0002	<0.0002	**0.0002**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0015**	<0.0002	<0.0002	<0.0002	**0.0002**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**113**	**105**	**112**	**99.5**	**107**
13C8-PFOA	----	0.0002	%		**107**	**102**	**104**	**100**	**102**

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2229393**	Page	: 1 of 7
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 11-Oct-2022
Order number	: ----	Date Analysis Commenced	: 12-Oct-2022
C-O-C number	: ----	Issue Date	: 21-Oct-2022
Sampler	: LUKE AMIES		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4633642)									
EB2229393-001	CR01	EA055: Moisture Content	----	0.1	%	8.3	8.8	6.4	0% - 20%
EB2229632-006	Anonymous	EA055: Moisture Content	----	0.1	%	13.1	13.7	4.4	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4633641)									
EB2229393-001	CR01	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0009	0.0007	28.4	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0006	0.0005	23.1	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2229632-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0009	0.0008	13.3	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0668	0.0594	11.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0033	0.0029	14.8	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.544	0.455	17.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4633641)									
EB2229393-001	CR01	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4633641) - continued									
EB2229393-001	CR01	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2229632-006	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0029	0.0026	12.5	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0009	0.0007	28.6	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0073	0.0061	17.9	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	<0.002	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4633641)									
EB2229393-001	CR01	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229632-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0016	0.0015	7.4	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4633641)									
EB2229393-001	CR01	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229632-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4633641)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	100	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	100	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	88.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	104	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	97.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	104	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4633641)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	95.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4633641)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.0	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4633641)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	94.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	99.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	87.9	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4633641) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	100	54.8	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4633641)							
EB2229393-002	CR02	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	103	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	89.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	106	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	90.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	88.3	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4633641)							
EB2229393-002	CR02	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	89.7	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	93.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	93.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	95.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	92.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	110	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	99.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	102	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	101	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4633641)							
EB2229393-002	CR02	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	102	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	112	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	95.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	98.4	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4633641) - continued							
EB2229393-002	CR02	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	96.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4633641)							
EB2229393-002	CR02	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	94.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	113	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	92.9	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	121	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2229393**	Page	: 1 of 4
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 11-Oct-2022
Site	: ----	Issue Date	: 21-Oct-2022
Sampler	: LUKE AMIES	No. of samples received	: 5
Order number	: ----	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
CR01, CR02, CR03, CR04, CR05	**05-Oct-2022**	**----**	----	----	**12-Oct-2022**	19-Oct-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
CR01, CR02, CR03, CR04, CR05	**05-Oct-2022**	**18-Oct-2022**	03-Apr-2023	✓	**19-Oct-2022**	27-Nov-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
CR01, CR02, CR03, CR04, CR05	**05-Oct-2022**	**18-Oct-2022**	03-Apr-2023	✓	**19-Oct-2022**	27-Nov-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
CR01, CR02, CR03, CR04, CR05	**05-Oct-2022**	**18-Oct-2022**	03-Apr-2023	✓	**19-Oct-2022**	27-Nov-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
CR01, CR02, CR03, CR04, CR05	**05-Oct-2022**	**18-Oct-2022**	03-Apr-2023	✓	**19-Oct-2022**	27-Nov-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
CR01, CR02, CR03, CR04, CR05	**05-Oct-2022**	**18-Oct-2022**	03-Apr-2023	✓	**19-Oct-2022**	27-Nov-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2229393**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: mkowalczyk@epicenvironmental.com.au	E-mail	: k.hiltonbarber@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BCL220033.01 CALLIDE	Page	: 1 of 3
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: LUKE AMIES		

Dates

Date Samples Received	: 11-Oct-2022 12:20	Issue Date	: 11-Oct-2022
Client Requested Due Date	: 21-Oct-2022	Scheduled Reporting Date	: **21-Oct-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 0.2°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- ***Samples were originally received by ALS Gladstone on 07/10/2022 (7°C), and forwarded to ALS Brisbane for analysis.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2229393-001	05-Oct-2022 00:00	CR01	✓	✓
EB2229393-002	05-Oct-2022 00:00	CR02	✓	✓
EB2229393-003	05-Oct-2022 00:00	CR03	✓	✓
EB2229393-004	05-Oct-2022 00:00	CR04	✓	✓
EB2229393-005	05-Oct-2022 00:00	CR05	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ESDAT REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au
- EDI Format - XTab (XTAB)	Email	epicenvironmental@esdat.com.au

INVOICES

- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au

LABS

- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	labs@epicenvironmental.com.au

LUKE AMIES

- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au

MICHAEL KOWALCZYK

- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

epic ENVIRONMENTAL

Chain of Custody Record

Project No:	BCL220033.01
Project/Site:	CALLIDE
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Luke Amies (lamies@epicenvironmental.com.au)
Phone:	0447 661 021
Page:	1 of 1
Number of Eskies:	

Lab:	ALS
Lab Quote No:	BN/344/21 V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other	Potable Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOPI) + TOF (EP040)	PFAS (EP231X)	HOLD
1	CR01	5/10/2022 0:00	Soil				x																					x	
2	CR02	5/10/2022 0:00	Soil				x																					x	
3	CR03	5/10/2022 0:00	Soil				x																					x	
4	CR04	5/10/2022 0:00	Soil				x																					x	
5	CR05	5/10/2022 0:00	Soil				x																					x	
			TOTALS				5																					5	

Environmental Division
Brisbane
Work Order Reference
EB2229393

Telephone : +61-7-3243 7222

Relinquished By:		Received By	
Luke Amies			
NAME	SIGNATURE	SIGNATURE	
DATE	06-Oct-22	DATE	7.10.22

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES:

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 17/95 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au

11/10/22
1220

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2229597**	Page	: 1 of 35
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 07-Oct-2022 08:50
Order number	: ----	Date Analysis Commenced	: 10-Oct-2022
C-O-C number	: ----	Issue Date	: 21-Oct-2022 17:03
Sampler	: LUKE AMIES		
Site	: CALLIDE		
Quote number	: BN/344/21 V3		
No. of samples received	: 70		
No. of samples analysed	: 70		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X PFAS: Sample 'FTG-A2-B7' shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- Particular samples have been crushed prior to preparation and analysis as per client request on the Chain of Custody. Please refer to SRN for further details.
- EP231X PFAS: Sample "FTG-A1-V1_0.5" shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- EP231X PFAS: Sample “FTG-A2-R2” required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP231X PFAS: Sample “FTG-A2-B4” required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
- EP231X PFAS: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly and matrix spike recoveries not determined.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **CONCRETE** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FTG-A2-R1	FTG-A2-R2	FTG-A2-R3	FTG-A2-R4	FTG-A2-R5
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
					EB2229597-001	EB2229597-002	EB2229597-003	EB2229597-004	EB2229597-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**1.0**	**10.7**	**1.2**	**9.9**	**8.1**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0026**	**0.0753**	**0.0024**	**0.0002**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0003**	**0.0066**	**0.0003**	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0270**	**0.667**	**0.0371**	**0.0036**	**0.0025**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.005	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0002**	**0.0016**	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0002**	**0.0018**	<0.0002	**0.0004**	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0025	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0025	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: CONCRETE (Matrix: SOIL)				Sample ID	FTG-A2-R1	FTG-A2-R2	FTG-A2-R3	FTG-A2-R4	FTG-A2-R5
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-001	EB2229597-002	EB2229597-003	EB2229597-004	EB2229597-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0025	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0025	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0025	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0010	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0010	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0010	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0010	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0303**	**0.752**	**0.0398**	**0.0042**	**0.0025**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0296**	**0.742**	**0.0395**	**0.0038**	**0.0025**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0300**	**0.746**	**0.0395**	**0.0042**	**0.0025**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**101**	**Not Determined**	**99.0**	**83.5**	**102**
13C8-PFOA	----	0.0002	%		**102**	**Not Determined**	**96.5**	**88.0**	**99.5**

Analytical Results

Sub-Matrix: **CONCRETE** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FTG-A2-R6	FTG-A2-R7	FTG-A2-R8	FTG-A2-R9	FTG-A2-R10
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
					EB2229597-006	EB2229597-007	EB2229597-008	EB2229597-009	EB2229597-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**14.1**	**2.5**	**2.0**	**6.7**	**8.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0002**	**0.0003**	**0.0026**	<0.0002	**0.0009**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	**0.0002**	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0024**	**0.0029**	**0.0243**	**0.0016**	**0.0078**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0021**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0002**	<0.0002	<0.0002	<0.0002	**0.0018**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: CONCRETE (Matrix: SOIL)				Sample ID	FTG-A2-R6	FTG-A2-R7	FTG-A2-R8	FTG-A2-R9	FTG-A2-R10
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-006	EB2229597-007	EB2229597-008	EB2229597-009	EB2229597-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	**0.0009**	<0.0005	**0.0006**	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0028**	**0.0041**	**0.0271**	**0.0022**	**0.0129**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0026**	**0.0032**	**0.0269**	**0.0016**	**0.0087**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0028**	**0.0041**	**0.0269**	**0.0022**	**0.0129**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**103**	**90.5**	**106**	**106**	**102**
13C8-PFOA	----	0.0002	%		**89.5**	**92.0**	**97.0**	**95.0**	**92.5**

Analytical Results

Sub-Matrix: CONCRETE (Matrix: SOIL)			Sample ID	BD01_0410	----	----	----	----
			Sampling date / time	04-Oct-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2229597-068	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**1.1**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0039**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	**0.0003**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0240**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0006**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	**0.0002**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: CONCRETE (Matrix: SOIL)				Sample ID	BD01_0410	----	----	----	----
				Sampling date / time	04-Oct-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2229597-068	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0290**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0279**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0287**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	----	----	----	----
13C8-PFOA	----	0.0002	%		**95.5**	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FTG-A1-V1_0.5	FTG-A1-V1_1.0	FTG-A1-V2_0.5	FTG-A1-V2_1.0	FTG-A1-V3_0.5
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
					EB2229597-011	EB2229597-012	EB2229597-013	EB2229597-014	EB2229597-015
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**6.0**	**5.3**	**8.2**	**12.8**	**6.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0004**	<0.0005	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0003**	<0.0005	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0021**	**0.0011**	**0.0009**	<0.0002	**0.0007**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0003**	<0.0005	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0581**	**0.319**	**0.0149**	**0.0167**	**0.0851**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0126**	<0.0005	<0.0002	<0.0002	**0.0015**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.002	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0019**	<0.0005	**0.0012**	<0.0002	**0.0036**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0032**	**0.0007**	**0.0017**	<0.0002	**0.0026**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0012**	<0.0005	**0.0006**	<0.0002	**0.0012**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0030**	**0.0028**	**0.0010**	<0.0002	**0.0010**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		**0.0016**	**0.0016**	**0.0012**	**0.0004**	**0.0030**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		**0.0019**	<0.0005	**0.0003**	<0.0002	**0.0006**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		**0.0008**	<0.0005	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		**0.0002**	<0.0005	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0012	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		**0.0004**	<0.0005	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0012	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A1-V1_0.5	FTG-A1-V1_1.0	FTG-A1-V2_0.5	FTG-A1-V2_1.0	FTG-A1-V3_0.5
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-011	EB2229597-012	EB2229597-013	EB2229597-014	EB2229597-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0012	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0012	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0012	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		**0.0147**	**0.0242**	**0.0010**	<0.0005	**0.0021**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		**0.0146**	**0.0007**	**0.0006**	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.117**	**0.350**	**0.0234**	**0.0171**	**0.101**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0602**	**0.320**	**0.0158**	**0.0167**	**0.0858**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0992**	**0.348**	**0.0219**	**0.0167**	**0.0963**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**94.0**	**80.0**	**102**	**120**	**99.0**
13C8-PFOA	----	0.0002	%		**105**	**95.0**	**101**	**111**	**110**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FTG-A1-V3_1.0	FTG-A1-V4_0.5	FTG-A1-V4_1.0	FTG-A1-V5_0.5	FTG-A1-V5_1.0
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
					EB2229597-016	EB2229597-017	EB2229597-018	EB2229597-019	EB2229597-020
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**10.9**	**7.4**	**11.7**	**5.7**	**9.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0003**	<0.0002	<0.0002	**0.0019**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0002**	<0.0002	<0.0002	<0.0002	**0.0009**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0166**	**0.0076**	**0.0099**	**0.0037**	**0.120**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0002**	**0.0043**	**0.0012**	**0.0002**	**0.0006**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0006**	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	**0.0008**	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0004**	**0.0005**	<0.0002	<0.0002	**0.0013**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		**0.0010**	**0.0021**	**0.0004**	<0.0002	**0.0005**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	**0.0008**	**0.0002**	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	**0.0005**	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0006
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0006

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A1-V3_1.0	FTG-A1-V4_0.5	FTG-A1-V4_1.0	FTG-A1-V5_0.5	FTG-A1-V5_1.0
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-016	EB2229597-017	EB2229597-018	EB2229597-019	EB2229597-020
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0006
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0006
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0006
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		**0.0029**	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	**0.0044**	**0.0020**	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0213**	**0.0223**	**0.0137**	**0.0039**	**0.125**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0166**	**0.0079**	**0.0099**	**0.0037**	**0.122**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0199**	**0.0146**	**0.0119**	**0.0037**	**0.123**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**97.5**	**96.5**	**96.0**	**113**	**92.5**
13C8-PFOA	----	0.0002	%		**109**	**100**	**102**	**99.5**	**97.5**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FTG-A1-V6_0.5	FTG-A1-V6_1.0	FTG-A1-V7_0.5	FTG-A1-V7_1.0	FTG-A1-V8_0.5
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
					EB2229597-021	EB2229597-022	EB2229597-023	EB2229597-024	EB2229597-025
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**5.1**	**13.4**	**9.4**	**9.6**	**18.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0025**	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0006**	<0.0002	**0.0002**	<0.0002	**0.0009**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0040**	**0.0018**	**0.0042**	**0.0031**	**0.0562**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0012**	**0.0003**	**0.0010**	<0.0002	**0.0007**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0004**	<0.0002	**0.0003**	**0.0005**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0006**	<0.0002	**0.0004**	**0.0006**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0006**	<0.0002	**0.0003**	**0.0005**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0008**	<0.0002	**0.0003**	**0.0005**	**0.0026**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		**0.0006**	**0.0004**	**0.0008**	**0.0013**	**0.0022**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		**0.0007**	**0.0004**	**0.0010**	**0.0005**	**0.0004**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		**0.0014**	**0.0004**	**0.0008**	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		**0.0005**	**0.0002**	**0.0006**	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A1-V6_0.5	FTG-A1-V6_1.0	FTG-A1-V7_0.5	FTG-A1-V7_1.0	FTG-A1-V8_0.5
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-021	EB2229597-022	EB2229597-023	EB2229597-024	EB2229597-025
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		**0.0005**	<0.0005	**0.0005**	<0.0005	**0.0045**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		**0.0016**	**0.0009**	**0.0068**	<0.0005	**0.0042**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0135**	**0.0044**	**0.0172**	**0.0095**	**0.0720**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0046**	**0.0018**	**0.0044**	**0.0031**	**0.0571**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0091**	**0.0027**	**0.0130**	**0.0052**	**0.0684**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**114**	**96.0**	**98.5**	**99.0**	**96.5**
13C8-PFOA	----	0.0002	%		**110**	**103**	**97.0**	**93.0**	**101**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A1-V8_1.0	FTG-A1-V9_0.5	FTG-A1-V9_1.0	FTG-A1-V10_0.5	FTG-A1-V10_1.0
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-026	EB2229597-027	EB2229597-028	EB2229597-029	EB2229597-030
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**17.6**	**17.1**	**16.6**	**16.8**	**21.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0004**	<0.0002	**0.0005**	**0.0002**	**0.0002**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0004**	<0.0002	**0.0005**	**0.0002**	**0.0003**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0031**	**0.0022**	**0.0048**	**0.0017**	**0.0034**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0004**	**0.0007**	**0.0004**	**0.0007**	**0.0004**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0339**	**0.130**	**0.0852**	**0.0484**	**0.238**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0094**	**0.0016**	<0.0002	**0.0051**	**0.0008**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	**0.002**	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0015**	**0.0008**	**0.0096**	**0.0013**	**0.0013**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0035**	**0.0016**	**0.0076**	**0.0022**	**0.0019**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0011**	**0.0007**	**0.0030**	**0.0007**	**0.0012**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0040**	**0.0039**	**0.0140**	**0.0028**	**0.0029**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		**0.0024**	**0.0092**	**0.0020**	**0.0047**	**0.0009**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		**0.0017**	**0.0012**	<0.0002	**0.0010**	**0.0003**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		**0.0016**	<0.0002	<0.0002	**0.0004**	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0005**	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A1-V8_1.0	FTG-A1-V9_0.5	FTG-A1-V9_1.0	FTG-A1-V10_0.5	FTG-A1-V10_1.0
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-026	EB2229597-027	EB2229597-028	EB2229597-029	EB2229597-030
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		**0.0111**	**0.0145**	**0.259**	**0.0090**	**0.0109**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		**0.0476**	**0.0252**	**0.0021**	**0.0960**	**0.0022**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		**0.0020**	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.125**	**0.192**	**0.391**	**0.175**	**0.265**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0370**	**0.132**	**0.0900**	**0.0501**	**0.241**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.106**	**0.179**	**0.388**	**0.162**	**0.262**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**116**	**118**	**124**	**105**	**102**
13C8-PFOA	----	0.0002	%		**103**	**90.0**	**113**	**92.0**	**98.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FTG-A2-V1_0.5	FTG-A2-V1_1.0	FTG-A2-B1	FTG-A2-V2_0.5	FTG-A2-V2_1.0
			Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2229597-031	EB2229597-032	EB2229597-033	EB2229597-034	EB2229597-035
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**9.2**	**9.3**	**9.6**	**7.9**	**11.9**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0004**	<0.0002	**0.0015**	**0.0007**	**0.0006**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0003**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0063**	**0.0044**	**0.0175**	**0.0006**	**0.0069**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	**0.0003**	<0.0002	**0.0016**	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	**0.0019**	**0.0003**	**0.0007**	**0.0003**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0016**	**0.0002**	**0.0008**	**0.0010**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	**0.0020**	**0.0006**	**0.0009**	**0.0004**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	**0.0030**	<0.0002	**0.0014**	<0.0002	**0.0007**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	**0.0037**	<0.0002	**0.0011**	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	**0.0008**	<0.0002	**0.0007**	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	**0.0003**	<0.0002	**0.0006**	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	**0.0006**	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A2-V1_0.5	FTG-A2-V1_1.0	FTG-A2-B1	FTG-A2-V2_0.5	FTG-A2-V2_1.0
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-031	EB2229597-032	EB2229597-033	EB2229597-034	EB2229597-035
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		**0.0026**	<0.0005	**0.0026**	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		**0.0080**	<0.0005	**0.0076**	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		**0.0006**	<0.0005	**0.0025**	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0315**	**0.0055**	**0.0401**	**0.0030**	**0.0085**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0067**	**0.0044**	**0.0190**	**0.0013**	**0.0075**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0258**	**0.0055**	**0.0330**	**0.0030**	**0.0082**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	**108**	**94.5**	**102**	**106**
13C8-PFOA	----	0.0002	%		**105**	**102**	**106**	**103**	**108**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FTG-A2-B2	FTG-A2-V3_0.5	FTG-A2-V3_1.0	FTG-A2-B3	FTG-A2-V4_0.5
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
					EB2229597-036	EB2229597-037	EB2229597-038	EB2229597-039	EB2229597-040
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**7.9**	**12.5**	**9.4**	**11.2**	**7.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0012**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0015**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0231**	<0.0002	**0.0006**	**0.0003**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0014**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0110**	<0.0002	<0.0002	**0.0114**	**0.0161**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0009**	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0006**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0038**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0013**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0042**	**0.0003**	<0.0002	**0.0003**	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0008**	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A2-B2	FTG-A2-V3_0.5	FTG-A2-V3_1.0	FTG-A2-B3	FTG-A2-V4_0.5
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-036	EB2229597-037	EB2229597-038	EB2229597-039	EB2229597-040
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**0.0007**	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0481**	**0.0003**	**0.0006**	**0.0150**	**0.0161**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0341**	<0.0002	**0.0006**	**0.0117**	**0.0161**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0452**	**0.0003**	**0.0006**	**0.0127**	**0.0161**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**116**	**113**	**109**	**111**	**99.0**
13C8-PFOA	----	0.0002	%		**104**	**104**	**112**	**113**	**100**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FTG-A2-V4_1.0	FTG-A2-B4	FTG-A2-V5_0.5	FTG-A2-V5_1.0	FTG-A2-B5
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
					EB2229597-041	EB2229597-042	EB2229597-043	EB2229597-044	EB2229597-045
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**11.1**	**11.5**	**7.1**	**7.3**	**8.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0005	**0.0004**	**0.0002**	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0005	**0.0006**	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0209**	**0.0098**	**0.0004**	**0.0040**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0007**	**0.0017**	<0.0002	<0.0002	**0.0004**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0300**	**0.253**	**0.0006**	**0.0002**	**0.0010**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.002	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0006**	**0.0005**	<0.0002	**0.0002**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0012**	**0.0016**	**0.0007**	**0.0006**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	**0.0017**	**0.0008**	<0.0002	**0.0006**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0003**	**0.0036**	**0.0021**	<0.0002	**0.0012**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0012	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0012	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A2-V4_1.0	FTG-A2-B4	FTG-A2-V5_0.5	FTG-A2-V5_1.0	FTG-A2-B5
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-041	EB2229597-042	EB2229597-043	EB2229597-044	EB2229597-045
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0012	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0012	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0012	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0310**	**0.283**	**0.0164**	**0.0015**	**0.0080**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0300**	**0.274**	**0.0104**	**0.0006**	**0.0050**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0303**	**0.281**	**0.0158**	**0.0015**	**0.0076**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**108**	**130**	**97.5**	**106**	**111**
13C8-PFOA	----	0.0002	%		**100**	**105**	**102**	**104**	**112**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FTG-A2-V6_0.5	FTG-A2-V6_1.0	FTG-A2-B6	FTG-A2-V7_0.5	FTG-A2-V7_1.0
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
					EB2229597-046	EB2229597-047	EB2229597-048	EB2229597-049	EB2229597-050
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**4.9**	**8.1**	**10.4**	**4.8**	**8.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0003**	**0.0005**	**0.0002**	**0.0003**	**0.0006**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	<0.0002	**0.0003**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0290**	**0.0409**	**0.0042**	**0.0094**	**0.0458**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0032**	**0.0003**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	**0.0002**	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0006**	**0.0003**	<0.0002	**0.0005**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		**0.0003**	**0.0003**	<0.0002	**0.0006**	**0.0012**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0008**	**0.0004**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A2-V6_0.5	FTG-A2-V6_1.0	FTG-A2-B6	FTG-A2-V7_0.5	FTG-A2-V7_1.0
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-046	EB2229597-047	EB2229597-048	EB2229597-049	EB2229597-050
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**0.0006**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0296**	**0.0427**	**0.0049**	**0.0146**	**0.0497**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0293**	**0.0414**	**0.0044**	**0.0097**	**0.0464**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0293**	**0.0420**	**0.0049**	**0.0097**	**0.0475**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**105**	**110**	**112**	**93.0**	**100**
13C8-PFOA	----	0.0002	%		**104**	**103**	**96.0**	**108**	**104**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FTG-A2-B7	FTG-A2-V8_0.5	FTG-A2-V8_1.0	FTG-A2-B8	FTG-A2-B9
			Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2229597-051	EB2229597-052	EB2229597-053	EB2229597-054	EB2229597-057
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**9.7**	**5.2**	**9.9**	**9.2**	**7.8**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0006**	**0.0002**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0079**	**0.0024**	**0.0004**	**0.0267**	**0.0091**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0011**	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0002**	**0.0007**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0002**	**0.0004**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0003**	**0.0006**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	**0.0003**	<0.0002	<0.0002	**0.0008**	**0.0012**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	**0.0008**	**0.0003**	<0.0002	**0.0012**	**0.0005**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	**0.0004**	<0.0002	<0.0002	**0.0007**	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0006**	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A2-B7	FTG-A2-V8_0.5	FTG-A2-V8_1.0	FTG-A2-B8	FTG-A2-B9
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-051	EB2229597-052	EB2229597-053	EB2229597-054	EB2229597-057
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**0.0028**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**0.0012**	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**0.0009**	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0094**	**0.0027**	**0.0004**	**0.0349**	**0.0155**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0079**	**0.0024**	**0.0004**	**0.0273**	**0.0093**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0082**	**0.0024**	**0.0004**	**0.0300**	**0.0150**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**107**	**87.5**	**97.0**	**112**	**102**
13C8-PFOA	----	0.0002	%		**106**	**108**	**120**	**104**	**110**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FTG-A2-B10	A3-V1	A3-B1	A3-V2	A3-B2
			Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2229597-060	EB2229597-061	EB2229597-062	EB2229597-063	EB2229597-064
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**9.3**	**12.5**	**14.5**	**10.5**	**8.0**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	**0.0007**	**0.0002**	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	**0.0019**	**0.0004**	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0008**	**0.0014**	**0.0116**	**0.0030**	**0.0014**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	**0.0006**	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0204**	**0.0066**	**0.0210**	**0.0119**	**0.0116**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	**0.0028**	**0.0071**	**0.0003**	**0.0005**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	**0.0007**	**0.0013**	**0.0015**	**0.0007**	**0.0004**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0005**	**0.0008**	**0.0030**	**0.0005**	**0.0004**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	**0.0010**	**0.0013**	**0.0033**	**0.0025**	**0.0012**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	**0.0010**	**0.0008**	**0.0052**	**0.0009**	**0.0006**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	**0.0005**	**0.0007**	**0.0033**	**0.0007**	**0.0006**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	**0.0002**	**0.0004**	**0.0019**	<0.0002	**0.0002**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	**0.0008**	**0.0028**	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	**0.0003**	**0.0023**	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	**0.0007**	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	**0.0008**	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A2-B10	A3-V1	A3-B1	A3-V2	A3-B2
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-060	EB2229597-061	EB2229597-062	EB2229597-063	EB2229597-064
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		**0.0009**	<0.0005	**0.0009**	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		**0.0020**	<0.0005	**0.0049**	**0.0006**	**0.0020**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	**0.0026**	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0280**	**0.0172**	**0.0761**	**0.0217**	**0.0189**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0212**	**0.0080**	**0.0326**	**0.0149**	**0.0130**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0273**	**0.0122**	**0.0521**	**0.0203**	**0.0176**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**117**	**102**	**94.0**	**101**	**103**
13C8-PFOA	----	0.0002	%		**108**	**112**	**108**	**106**	**114**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	A3-V3	A3-B3	A3-V4	BD02_0410	BD03_0410
			Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2229597-065	EB2229597-066	EB2229597-067	EB2229597-069	EB2229597-070
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**3.6**	**9.4**	**3.0**	**9.0**	**7.8**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	**0.0002**	**0.0013**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0036**	**0.0058**	**0.0299**	**0.0195**	**0.0159**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	**0.0010**	**0.0013**	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	**0.0002**	<0.0002	**0.0002**	**0.0005**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	**0.0003**	**0.0007**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	**0.0003**	**0.0004**	**0.0006**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	**0.0002**	**0.0005**	**0.0013**	**0.0004**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	**0.0002**	**0.0006**	**0.0010**	**0.0008**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	**0.0009**	**0.0006**	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	**0.0003**	**0.0006**	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	A3-V3	A3-B3	A3-V4	BD02_0410	BD03_0410
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229597-065	EB2229597-066	EB2229597-067	EB2229597-069	EB2229597-070
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**0.0021**	**0.0028**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**0.0057**	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**0.0023**	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0038**	**0.0065**	**0.0343**	**0.0379**	**0.0199**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0036**	**0.0058**	**0.0301**	**0.0208**	**0.0159**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0038**	**0.0063**	**0.0315**	**0.0317**	**0.0191**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**108**	**118**	**112**	**103**	**104**
13C8-PFOA	----	0.0002	%		**104**	**107**	**109**	**106**	**108**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD04_0410	BD05_0410	BD06_0410	----	----
			Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2229597-071	EB2229597-072	EB2229597-073	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**10.4**	**6.0**	**11.2**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	**0.0008**	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	**0.0003**	<0.0002	**0.0022**	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0041**	**0.0014**	**0.0128**	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	**0.0003**	<0.0002	**0.0008**	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0008**	**0.0120**	**0.0273**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	**0.0006**	**0.0084**	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	**0.0003**	**0.0002**	**0.0012**	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0006**	**0.0004**	**0.0032**	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	**0.0004**	**0.0003**	**0.0032**	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	**0.0012**	**0.0004**	**0.0049**	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	**0.0006**	**0.0040**	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	**0.0012**	**0.0020**	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	**0.0008**	**0.0031**	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	**0.0009**	**0.0025**	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	**0.0008**	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	**0.0008**	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD04_0410	BD05_0410	BD06_0410	----	----
				Sampling date / time	04-Oct-2022 00:00	04-Oct-2022 00:00	04-Oct-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2229597-071	EB2229597-072	EB2229597-073	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	**0.0007**	**0.0011**	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	**0.0040**	**0.0047**	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	**0.0026**	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0080**	**0.0235**	**0.0864**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0049**	**0.0134**	**0.0401**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0074**	**0.0194**	**0.0592**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	**91.0**	**109**	----	----
13C8-PFOA	----	0.0002	%		**118**	**110**	**100**	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB_0410	----	----	----	----
				Sampling date / time	04-Oct-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2229597-074	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB_0410	----	----	----	----
				Sampling date / time	04-Oct-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2229597-074	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.7**	----	----	----	----
13C8-PFOA	----	0.02	%		**95.7**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **CONCRETE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2229597**	Page	: 1 of 23
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 07-Oct-2022
Order number	: ----	Date Analysis Commenced	: 10-Oct-2022
C-O-C number	: ----	Issue Date	: 21-Oct-2022
Sampler	: LUKE AMIES		
Site	: CALLIDE		
Quote number	: BN/344/21 V3		
No. of samples received	: 70		
No. of samples analysed	: 70		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4627552)									
EB2229597-011	FTG-A1-V1_0.5	EA055: Moisture Content	----	0.1	%	6.0	5.3	12.3	0% - 20%
EB2229597-021	FTG-A1-V6_0.5	EA055: Moisture Content	----	0.1	%	5.1	5.0	3.1	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4627554)									
EB2229597-031	FTG-A2-V1_0.5	EA055: Moisture Content	----	0.1	%	9.2	8.1	12.2	0% - 20%
EB2229597-041	FTG-A2-V4_1.0	EA055: Moisture Content	----	0.1	%	11.1	11.0	1.1	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4627556)									
EB2229597-051	FTG-A2-B7	EA055: Moisture Content	----	0.1	%	9.7	9.8	1.8	0% - 20%
EB2229597-065	A3-V3	EA055: Moisture Content	----	0.1	%	3.6	3.2	9.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4628073)									
EB2229474-001	Anonymous	EA055: Moisture Content	----	0.1	%	16.5	19.0	14.3	0% - 50%
EB2229597-005	FTG-A2-R5	EA055: Moisture Content	----	0.1	%	8.1	8.8	7.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4627551)									
EB2229597-011	FTG-A1-V1_0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0004	<0.0002	60.1	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0003	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0021	0.0015	34.4	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0581	# 0.0423	31.4	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0126	# 0.0087	36.5	0% - 20%
EB2229597-021	FTG-A1-V6_0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0006	0.0007	27.3	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0040	0.0047	17.9	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4627551) - continued									
EB2229597-021	FTG-A1-V6_0.5	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0012	0.0016	24.2	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4627553)									
EB2229597-031	FTG-A2-V1_0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0063	0.0071	11.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
EB2229597-041	FTG-A2-V4_1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0007	0.0008	18.1	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0300	0.0363	19.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4627555)									
EB2229597-051	FTG-A2-B7	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0079	# 0.0050	45.5	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2229597-065	A3-V3	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0036	0.0039	8.5	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4628072)									
EB2229474-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0010	0.0012	23.8	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2229597-004	FTG-A2-R4	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0036	0.0037	3.6	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4627551)									
EB2229597-011	FTG-A1-V1_0.5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0019	0.0009	76.5	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0032	# 0.0016	64.5	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0012	0.0007	49.8	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0030	# 0.0014	75.7	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0016	0.0008	69.2	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0019	0.0011	50.4	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0008	0.0007	20.3	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2229597-021	FTG-A1-V6_0.5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0004	0.0005	29.4	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0006	0.0008	26.2	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0006	0.0008	27.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0008	0.0012	38.5	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0006	0.0008	29.1	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0007	0.0009	27.1	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0014	0.0019	28.7	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0005	0.0007	29.6	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4627553)									
EB2229597-031	FTG-A2-V1_0.5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0019	0.0023	19.3	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0016	0.0016	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0020	0.0022	7.8	0% - 50%
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0030	0.0035	17.7	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0037	0.0039	6.4	0% - 50%
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0008	0.0008	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2229597-041	FTG-A2-V4_1.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0003	0.0004	31.3	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4627553) - continued									
EB2229597-041	FTG-A2-V4_1.0	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4627555)									
EB2229597-051	FTG-A2-B7	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0003	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0008	0.0006	33.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0004	0.0003	30.4	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2229597-065	A3-V3	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4628072)									
EB2229474-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4628072) - continued									
EB2229597-004	FTG-A2-R4	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4627551)									
EB2229597-011	FTG-A1-V1_0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0004	0.0002	51.8	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229597-021	FTG-A1-V6_0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4627553)									
EB2229597-031	FTG-A2-V1_0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4627553) - continued									
EB2229597-031	FTG-A2-V1_0.5	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229597-041	FTG-A2-V4_1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4627555)									
EB2229597-051	FTG-A2-B7	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229597-065	A3-V3	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4627555) - continued									
EB2229597-065	A3-V3	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4628072)									
EB2229474-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229597-004	FTG-A2-R4	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4627551)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4627551) - continued									
EB2229597-011	FTG-A1-V1_0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0147	# 0.0053	94.0	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0146	# 0.0079	59.7	0% - 20%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229597-021	FTG-A1-V6_0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0005	0.0006	20.5	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0016	0.0021	26.7	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4627553)									
EB2229597-031	FTG-A2-V1_0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0026	0.0032	19.2	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0080	0.0088	8.7	0% - 50%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	0.0006	0.0006	0.0	No Limit
EB2229597-041	FTG-A2-V4_1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4627555)									
EB2229597-051	FTG-A2-B7	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4627555) - continued									
EB2229597-051	FTG-A2-B7	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229597-065	A3-V3	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4628072)									
EB2229474-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229597-004	FTG-A2-R4	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4644135)									
EB2230100-007	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.05	<0.05	0.0	No Limit
EB2230205-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.20	1.25	3.6	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	3.04	3.21	5.6	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.22	0.19	10.6	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.22	0.22	0.0	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.16	0.17	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4644135) - continued									
EB2230205-001	Anonymous	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4644135)									
EB2230100-007	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.2	<0.2	0.0	No Limit
EB2230205-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.55	0.58	4.3	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	1.04	1.05	1.3	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	1.08	1.10	2.2	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.47	0.50	6.3	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.3	0.3	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4644135)									
EB2230100-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.12	<0.12	0.0	No Limit
EB2230205-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4644135) - continued									
EB2230205-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4644135)									
EB2230100-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EB2230205-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.18	0.18	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4644135)									
EB2230100-007	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.05	<0.05	0.0	No Limit
EB2230205-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	8.54	8.83	3.3	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	4.24	4.46	5.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	8.08	8.36	3.4	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4627551)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	95.9	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	103	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	97.9	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	90.3	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	96.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	95.4	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4627553)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	97.7	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	86.3	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	90.7	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	112	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	89.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	92.1	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4627555)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	85.9	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	93.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	87.3	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	91.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	95.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	90.0	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4628072)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	94.5	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	90.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.9	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	92.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	84.5	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	80.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4627551)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	97.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	72.0	129

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4627551) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.7	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4627553)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	93.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.1	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4627555)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	78.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.4	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4628072)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	86.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	64.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4628072) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4627551)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.6	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4627553)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.5	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.8	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.2	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.5	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4627555)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.0	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	77.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.2	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.8	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	61.0	139

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4628072)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.9	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.8	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.5	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.4	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4627551)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	93.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	94.2	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	90.4	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4627553)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	88.5	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	83.9	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	93.8	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	75.8	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4627555)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	85.9	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	91.5	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	65.8	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	70.8	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4628072)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	81.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	77.5	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	96.7	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	81.7	54.8	124

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4644135)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	116	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	125	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	114	68.0	131

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4644135) - continued								
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	130	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	121	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	121	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4644135)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	125	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	116	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	116	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	127	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	98.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4644135)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	115	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	124	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	112	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	107	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	121	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	115	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	116	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4644135)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	117	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	116	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	132	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	132	64.2	133
EP231P: PFAS Sums (QCLot: 4644135)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4627551)							
EB2229597-012	FTG-A1-V1_1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	# Not Determined	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	# Not Determined	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	# Not Determined	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	# Not Determined	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	# Not Determined	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4627553)							
EB2229597-032	FTG-A2-V1_1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	88.2	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	73.1	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	80.1	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	102	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	110	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	85.8	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4627555)							
EB2229597-052	FTG-A2-V8_0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	81.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	89.7	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	91.1	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	88.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	123	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	77.1	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4628072)							
EB2229474-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	95.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	82.5	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	89.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	100	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	90.9	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	95.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4627551)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4627551) - continued							
EB2229597-012	FTG-A1-V1_1.0	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	# Not Determined	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	# Not Determined	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	# Not Determined	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	# Not Determined	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	# Not Determined	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	# Not Determined	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	# Not Determined	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	# Not Determined	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	# Not Determined	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	# Not Determined	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	# Not Determined	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4627553)							
EB2229597-032	FTG-A2-V1_1.0	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	72.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	77.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	97.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	100.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	88.0	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	77.6	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	86.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	83.6	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	89.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	81.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	80.0	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4627555)							
EB2229597-052	FTG-A2-V8_0.5	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	80.7	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	87.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	86.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	84.0	71.0	131

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4627555) - continued							
EB2229597-052	FTG-A2-V8_0.5	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	89.6	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	94.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	86.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	94.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	88.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	87.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	88.0	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4628072)							
EB2229474-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	79.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	82.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	95.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	95.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	87.6	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	88.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	90.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	94.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	88.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	86.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	85.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4627551)							
EB2229597-012	FTG-A1-V1_1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	# Not Determined	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	# Not Determined	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	# Not Determined	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	# Not Determined	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4627553)							
EB2229597-032	FTG-A2-V1_1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	78.4	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	94.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	92.5	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4627553) - continued							
EB2229597-032	FTG-A2-V1_1.0	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	81.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	83.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	82.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	92.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4627555)							
EB2229597-052	FTG-A2-V8_0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	83.6	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	77.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	89.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	86.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	93.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	84.8	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4628072)							
EB2229474-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	84.0	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	85.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	87.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	96.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	88.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	102	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	95.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4627551)							
EB2229597-012	FTG-A1-V1_1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	# Not Determined	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	# Not Determined	64.0	140

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Acceptable Limits (%) Low	Acceptable Limits (%) High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4627551) - continued							
EB2229597-012	FTG-A1-V1_1.0	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	# Not Determined	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	# Not Determined	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4627553)							
EB2229597-032	FTG-A2-V1_1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	82.5	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	83.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	70.8	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4627555)							
EB2229597-052	FTG-A2-V8_0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	79.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	96.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	87.1	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	85.4	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4628072)							
EB2229474-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	95.7	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	82.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	106	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	72.1	70.0	130

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Acceptable Limits (%) Low	Acceptable Limits (%) High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4644135)							
EB2229918-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	114	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	125	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	113	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	132	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	101	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	110	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4644135)							
EB2229918-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	108	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	112	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	103	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	110	71.0	129

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4644135) - continued							
EB2229918-001	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	104	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	124	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	107	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	97.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4644135)							
EB2229918-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	105	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	124	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	121	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	112	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	111	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	118	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4644135)							
EB2229918-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	103	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	112	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	98.1	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	106	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2229597**	Page	: 1 of 11
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 07-Oct-2022
Site	: CALLIDE	Issue Date	: 21-Oct-2022
Sampler	: LUKE AMIES	No. of samples received	: 70
Order number	: ----	No. of samples analysed	: 70

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2229597--011	FTG-A1-V1_0.5	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	31.4 %	0% - 20%	**RPD exceeds LOR based limits**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2229597--051	FTG-A2-B7	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	45.5 %	0% - 20%	**RPD exceeds LOR based limits**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2229597--011	FTG-A1-V1_0.5	**Perfluorodecane sulfonic acid (PFDS)**	335-77-3	36.5 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EB2229597--011	FTG-A1-V1_0.5	**Perfluorohexanoic acid (PFHxA)**	307-24-4	64.5 %	0% - 50%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EB2229597--011	FTG-A1-V1_0.5	**Perfluorooctanoic acid (PFOA)**	335-67-1	75.7 %	0% - 50%	**RPD exceeds LOR based limits**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EB2229597--011	FTG-A1-V1_0.5	**6:2 Fluorotelomer sulfonic acid (6:2 FTS)**	27619-97-2	94.0 %	0% - 20%	**RPD exceeds LOR based limits**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EB2229597--011	FTG-A1-V1_0.5	**8:2 Fluorotelomer sulfonic acid (8:2 FTS)**	39108-34-4	59.7 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2229597--012	FTG-A1-V1_1.0	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EB2229597--012	FTG-A1-V1_1.0	**6:2 Fluorotelomer sulfonic acid (6:2 FTS)**	27619-97-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
FTG-A1-V1_0.5, FTG-A1-V1_1.0, FTG-A1-V2_0.5, FTG-A1-V2_1.0, FTG-A1-V3_0.5, FTG-A1-V3_1.0, FTG-A1-V4_0.5, FTG-A1-V4_1.0, FTG-A1-V5_0.5, FTG-A1-V5_1.0, FTG-A1-V6_0.5, FTG-A1-V6_1.0, FTG-A1-V7_0.5, FTG-A1-V7_1.0, FTG-A1-V8_0.5, FTG-A1-V8_1.0, FTG-A2-B1, FTG-A1-V9_0.5, FTG-A1-V9_1.0, FTG-A1-V10_0.5, FTG-A1-V10_1.0, FTG-A2-V1_0.5, FTG-A2-V1_1.0, FTG-A2-V2_0.5, FTG-A2-V2_1.0, FTG-A2-B2, FTG-A2-V3_0.5, FTG-A2-V3_1.0, FTG-A2-B3, FTG-A2-V4_0.5, FTG-A2-V4_1.0, FTG-A2-B4, FTG-A2-V5_0.5, FTG-A2-V5_1.0, A3-V1, FTG-A2-B5, FTG-A2-V6_0.5, FTG-A2-V6_1.0, FTG-A2-B6, FTG-A2-V7_0.5, FTG-A2-V7_1.0, FTG-A2-B7, FTG-A2-V8_0.5, FTG-A2-V8_1.0, FTG-A2-B8, FTG-A2-B9, FTG-A2-B10, A3-B1, A3-V2, A3-B2, A3-V3, A3-B3, A3-V4, BD02_0410, BD03_0410, BD04_0410, BD05_0410, BD06_0410	**04-Oct-2022**	**----**	----	----	**10-Oct-2022**	18-Oct-2022	✓
Snap Lock Bag (EA055)							
FTG-A2-R1, FTG-A2-R2, FTG-A2-R3, FTG-A2-R4, FTG-A2-R5, FTG-A2-R6, FTG-A2-R7, FTG-A2-R8, FTG-A2-R9, FTG-A2-R10, BD01_0410	**04-Oct-2022**	**----**	----	----	**10-Oct-2022**	18-Oct-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FTG-A1-V1_0.5, FTG-A1-V1_1.0, FTG-A1-V2_0.5, FTG-A1-V2_1.0, FTG-A1-V3_0.5, FTG-A1-V3_1.0, FTG-A1-V4_0.5, FTG-A1-V4_1.0, FTG-A1-V5_0.5, FTG-A1-V5_1.0, FTG-A1-V6_0.5, FTG-A1-V6_1.0, FTG-A1-V7_0.5, FTG-A1-V7_1.0, FTG-A1-V8_0.5, FTG-A1-V8_1.0, FTG-A2-B1, FTG-A1-V9_0.5, FTG-A1-V9_1.0, FTG-A1-V10_0.5, FTG-A1-V10_1.0, FTG-A2-V1_0.5, FTG-A2-V1_1.0, FTG-A2-V2_0.5, FTG-A2-V2_1.0, FTG-A2-B2, FTG-A2-V3_0.5, FTG-A2-V3_1.0, FTG-A2-B3, FTG-A2-V4_0.5, FTG-A2-V4_1.0, FTG-A2-B4, FTG-A2-V5_0.5, FTG-A2-V5_1.0, A3-V1, FTG-A2-B5, FTG-A2-V6_0.5, FTG-A2-V6_1.0, FTG-A2-B6, FTG-A2-V7_0.5, FTG-A2-V7_1.0, FTG-A2-B7, FTG-A2-V8_0.5, FTG-A2-V8_1.0, FTG-A2-B8, FTG-A2-B9, FTG-A2-B10, A3-B1, A3-V2, A3-B2, A3-V3, A3-B3, A3-V4, BD02_0410, BD03_0410, BD04_0410, BD05_0410, BD06_0410	**04-Oct-2022**	**17-Oct-2022**	02-Apr-2023	✓	**19-Oct-2022**	26-Nov-2022	✓
Snap Lock Bag (EP231X)							
FTG-A2-R1, FTG-A2-R2, FTG-A2-R3, FTG-A2-R4, FTG-A2-R5, FTG-A2-R6, FTG-A2-R7, FTG-A2-R8, FTG-A2-R9, FTG-A2-R10, BD01_0410	**04-Oct-2022**	**14-Oct-2022**	02-Apr-2023	✓	**16-Oct-2022**	23-Nov-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
FTG-A1-V1_0.5, FTG-A1-V1_1.0, FTG-A1-V2_0.5, FTG-A1-V2_1.0, FTG-A1-V3_0.5, FTG-A1-V3_1.0, FTG-A1-V4_0.5, FTG-A1-V4_1.0, FTG-A1-V5_0.5, FTG-A1-V5_1.0, FTG-A1-V6_0.5, FTG-A1-V6_1.0, FTG-A1-V7_0.5, FTG-A1-V7_1.0, FTG-A1-V8_0.5, FTG-A1-V8_1.0, FTG-A2-B1, FTG-A1-V9_0.5, FTG-A1-V9_1.0, FTG-A1-V10_0.5, FTG-A1-V10_1.0, FTG-A2-V1_0.5, FTG-A2-V1_1.0, FTG-A2-V2_0.5, FTG-A2-V2_1.0, FTG-A2-B2, FTG-A2-V3_0.5, FTG-A2-V3_1.0, FTG-A2-B3, FTG-A2-V4_0.5, FTG-A2-V4_1.0, FTG-A2-B4, FTG-A2-V5_0.5, FTG-A2-V5_1.0, A3-V1, FTG-A2-B5, FTG-A2-V6_0.5, FTG-A2-V6_1.0, FTG-A2-B6, FTG-A2-V7_0.5, FTG-A2-V7_1.0, FTG-A2-B7, FTG-A2-V8_0.5, FTG-A2-V8_1.0, FTG-A2-B8, FTG-A2-B9, FTG-A2-B10, A3-B1, A3-V2, A3-B2, A3-V3, A3-B3, A3-V4, BD02_0410, BD03_0410, BD04_0410, BD05_0410, BD06_0410	**04-Oct-2022**	**17-Oct-2022**	02-Apr-2023	✓	**19-Oct-2022**	26-Nov-2022	✓
Snap Lock Bag (EP231X)							
FTG-A2-R1, FTG-A2-R2, FTG-A2-R3, FTG-A2-R4, FTG-A2-R5, FTG-A2-R6, FTG-A2-R7, FTG-A2-R8, FTG-A2-R9, FTG-A2-R10, BD01_0410	**04-Oct-2022**	**14-Oct-2022**	02-Apr-2023	✓	**16-Oct-2022**	23-Nov-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
FTG-A1-V1_0.5, FTG-A1-V1_1.0, FTG-A1-V2_0.5, FTG-A1-V2_1.0, FTG-A1-V3_0.5, FTG-A1-V3_1.0, FTG-A1-V4_0.5, FTG-A1-V4_1.0, FTG-A1-V5_0.5, FTG-A1-V5_1.0, FTG-A1-V6_0.5, FTG-A1-V6_1.0, FTG-A1-V7_0.5, FTG-A1-V7_1.0, FTG-A1-V8_0.5, FTG-A1-V8_1.0, FTG-A2-B1, FTG-A1-V9_0.5, FTG-A1-V9_1.0, FTG-A1-V10_0.5, FTG-A1-V10_1.0, FTG-A2-V1_0.5, FTG-A2-V1_1.0, FTG-A2-V2_0.5, FTG-A2-V2_1.0, FTG-A2-B2, FTG-A2-V3_0.5, FTG-A2-V3_1.0, FTG-A2-B3, FTG-A2-V4_0.5, FTG-A2-V4_1.0, FTG-A2-B4, FTG-A2-V5_0.5, FTG-A2-V5_1.0, A3-V1, FTG-A2-B5, FTG-A2-V6_0.5, FTG-A2-V6_1.0, FTG-A2-B6, FTG-A2-V7_0.5, FTG-A2-V7_1.0, FTG-A2-B7, FTG-A2-V8_0.5, FTG-A2-V8_1.0, FTG-A2-B8, FTG-A2-B9, FTG-A2-B10, A3-B1, A3-V2, A3-B2, A3-V3, A3-B3, A3-V4, BD02_0410, BD03_0410, BD04_0410, BD05_0410, BD06_0410	**04-Oct-2022**	**17-Oct-2022**	02-Apr-2023	✓	**19-Oct-2022**	26-Nov-2022	✓
Snap Lock Bag (EP231X)							
FTG-A2-R1, FTG-A2-R2, FTG-A2-R3, FTG-A2-R4, FTG-A2-R5, FTG-A2-R6, FTG-A2-R7, FTG-A2-R8, FTG-A2-R9, FTG-A2-R10, BD01_0410	**04-Oct-2022**	**14-Oct-2022**	02-Apr-2023	✓	**16-Oct-2022**	23-Nov-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FTG-A1-V1_0.5, FTG-A1-V1_1.0, FTG-A1-V2_0.5, FTG-A1-V2_1.0, FTG-A1-V3_0.5, FTG-A1-V3_1.0, FTG-A1-V4_0.5, FTG-A1-V4_1.0, FTG-A1-V5_0.5, FTG-A1-V5_1.0, FTG-A1-V6_0.5, FTG-A1-V6_1.0, FTG-A1-V7_0.5, FTG-A1-V7_1.0, FTG-A1-V8_0.5, FTG-A1-V8_1.0, FTG-A2-B1, FTG-A1-V9_0.5, FTG-A1-V9_1.0, FTG-A1-V10_0.5, FTG-A1-V10_1.0, FTG-A2-V1_0.5, FTG-A2-V1_1.0, FTG-A2-V2_0.5, FTG-A2-V2_1.0, FTG-A2-B2, FTG-A2-V3_0.5, FTG-A2-V3_1.0, FTG-A2-B3, FTG-A2-V4_0.5, FTG-A2-V4_1.0, FTG-A2-B4, FTG-A2-V5_0.5, FTG-A2-V5_1.0, A3-V1, FTG-A2-B5, FTG-A2-V6_0.5, FTG-A2-V6_1.0, FTG-A2-B6, FTG-A2-V7_0.5, FTG-A2-V7_1.0, FTG-A2-B7, FTG-A2-V8_0.5, FTG-A2-V8_1.0, FTG-A2-B8, FTG-A2-B9, FTG-A2-B10, A3-B1, A3-V2, A3-B2, A3-V3, A3-B3, A3-V4, BD02_0410, BD03_0410, BD04_0410, BD05_0410, BD06_0410	**04-Oct-2022**	**17-Oct-2022**	02-Apr-2023	✓	**19-Oct-2022**	26-Nov-2022	✓
Snap Lock Bag (EP231X)							
FTG-A2-R1, FTG-A2-R2, FTG-A2-R3, FTG-A2-R4, FTG-A2-R5, FTG-A2-R6, FTG-A2-R7, FTG-A2-R8, FTG-A2-R9, FTG-A2-R10, BD01_0410	**04-Oct-2022**	**14-Oct-2022**	02-Apr-2023	✓	**16-Oct-2022**	23-Nov-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
FTG-A1-V1_0.5, FTG-A1-V1_1.0, FTG-A1-V2_0.5, FTG-A1-V2_1.0, FTG-A1-V3_0.5, FTG-A1-V3_1.0, FTG-A1-V4_0.5, FTG-A1-V4_1.0, FTG-A1-V5_0.5, FTG-A1-V5_1.0, FTG-A1-V6_0.5, FTG-A1-V6_1.0, FTG-A1-V7_0.5, FTG-A1-V7_1.0, FTG-A1-V8_0.5, FTG-A1-V8_1.0, FTG-A2-B1, FTG-A1-V9_0.5, FTG-A1-V9_1.0, FTG-A1-V10_0.5, FTG-A1-V10_1.0, FTG-A2-V1_0.5, FTG-A2-V1_1.0, FTG-A2-V2_0.5, FTG-A2-V2_1.0, FTG-A2-B2, FTG-A2-V3_0.5, FTG-A2-V3_1.0, FTG-A2-B3, FTG-A2-V4_0.5, FTG-A2-V4_1.0, FTG-A2-B4, FTG-A2-V5_0.5, FTG-A2-V5_1.0, A3-V1, FTG-A2-B5, FTG-A2-V6_0.5, FTG-A2-V6_1.0, FTG-A2-B6, FTG-A2-V7_0.5, FTG-A2-V7_1.0, FTG-A2-B7, FTG-A2-V8_0.5, FTG-A2-V8_1.0, FTG-A2-B8, FTG-A2-B9, FTG-A2-B10, A3-B1, A3-V2, A3-B2, A3-V3, A3-B3, A3-V4, BD02_0410, BD03_0410, BD04_0410, BD05_0410, BD06_0410	**04-Oct-2022**	**17-Oct-2022**	02-Apr-2023	✓	**19-Oct-2022**	26-Nov-2022	✓
Snap Lock Bag (EP231X)							
FTG-A2-R1, FTG-A2-R2, FTG-A2-R3, FTG-A2-R4, FTG-A2-R5, FTG-A2-R6, FTG-A2-R7, FTG-A2-R8, FTG-A2-R9, FTG-A2-R10, BD01_0410	**04-Oct-2022**	**14-Oct-2022**	02-Apr-2023	✓	**16-Oct-2022**	23-Nov-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
RB_0410	**04-Oct-2022**	**18-Oct-2022**	02-Apr-2023	✓	**18-Oct-2022**	02-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
RB_0410	**04-Oct-2022**	**18-Oct-2022**	02-Apr-2023	✓	**18-Oct-2022**	02-Apr-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
RB_0410	**04-Oct-2022**	**18-Oct-2022**	02-Apr-2023	✓	**18-Oct-2022**	02-Apr-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
RB_0410	**04-Oct-2022**	**18-Oct-2022**	02-Apr-2023	✓	**18-Oct-2022**	02-Apr-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
RB_0410	**04-Oct-2022**	**18-Oct-2022**	02-Apr-2023	✓	**18-Oct-2022**	02-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	8	75	**10.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	8	76	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	76	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	76	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	76	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Dry and Crush	EN84	SOIL	In house
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2229597**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: k.hiltonbarber@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BCL220033.01 CALLIDE	Page	: 1 of 5
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: CALLIDE		
Sampler	: LUKE AMIES		

Dates

Date Samples Received	: 07-Oct-2022 08:50	Issue Date	: 10-Oct-2022
Client Requested Due Date	: 21-Oct-2022	Scheduled Reporting Date	: **21-Oct-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 16.9°C, 15.7°C, 17.7°C, 14.7°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 70 / 70

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please be advised that the following samples were not received at the laboratory (denoted SNR on the scanned COC):FTG-A2-V9_0.5, FTG-A2-V9_1.0, FTG-A2-V10_0.5, FTG-A2-V10_1.0**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **6 samples with prefix SD0 have been forwarded to Eurofins as requested. Please note that this will incur a freight forwarding fee.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EN84 Dry and Crush	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2229597-001	04-Oct-2022 00:00	FTG-A2-R1	✓	✓	✓
EB2229597-002	04-Oct-2022 00:00	FTG-A2-R2	✓	✓	✓
EB2229597-003	04-Oct-2022 00:00	FTG-A2-R3	✓	✓	✓
EB2229597-004	04-Oct-2022 00:00	FTG-A2-R4	✓	✓	✓
EB2229597-005	04-Oct-2022 00:00	FTG-A2-R5	✓	✓	✓
EB2229597-006	04-Oct-2022 00:00	FTG-A2-R6	✓	✓	✓
EB2229597-007	04-Oct-2022 00:00	FTG-A2-R7	✓	✓	✓
EB2229597-008	04-Oct-2022 00:00	FTG-A2-R8	✓	✓	✓
EB2229597-009	04-Oct-2022 00:00	FTG-A2-R9	✓	✓	✓
EB2229597-010	04-Oct-2022 00:00	FTG-A2-R10	✓	✓	✓
EB2229597-011	04-Oct-2022 00:00	FTG-A1-V1_0.5	✓		✓
EB2229597-012	04-Oct-2022 00:00	FTG-A1-V1_1.0	✓		✓
EB2229597-013	04-Oct-2022 00:00	FTG-A1-V2_0.5	✓		✓
EB2229597-014	04-Oct-2022 00:00	FTG-A1-V2_1.0	✓		✓
EB2229597-015	04-Oct-2022 00:00	FTG-A1-V3_0.5	✓		✓
EB2229597-016	04-Oct-2022 00:00	FTG-A1-V3_1.0	✓		✓
EB2229597-017	04-Oct-2022 00:00	FTG-A1-V4_0.5	✓		✓
EB2229597-018	04-Oct-2022 00:00	FTG-A1-V4_1.0	✓		✓
EB2229597-019	04-Oct-2022 00:00	FTG-A1-V5_0.5	✓		✓
EB2229597-020	04-Oct-2022 00:00	FTG-A1-V5_1.0	✓		✓
EB2229597-021	04-Oct-2022 00:00	FTG-A1-V6_0.5	✓		✓
EB2229597-022	04-Oct-2022 00:00	FTG-A1-V6_1.0	✓		✓
EB2229597-023	04-Oct-2022 00:00	FTG-A1-V7_0.5	✓		✓
EB2229597-024	04-Oct-2022 00:00	FTG-A1-V7_1.0	✓		✓
EB2229597-025	04-Oct-2022 00:00	FTG-A1-V8_0.5	✓		✓
EB2229597-026	04-Oct-2022 00:00	FTG-A1-V8_1.0	✓		✓
EB2229597-027	04-Oct-2022 00:00	FTG-A1-V9_0.5	✓		✓
EB2229597-028	04-Oct-2022 00:00	FTG-A1-V9_1.0	✓		✓
EB2229597-029	04-Oct-2022 00:00	FTG-A1-V10_0.5	✓		✓
EB2229597-030	04-Oct-2022 00:00	FTG-A1-V10_1.0	✓		✓
EB2229597-031	04-Oct-2022 00:00	FTG-A2-V1_0.5	✓		✓
EB2229597-032	04-Oct-2022 00:00	FTG-A2-V1_1.0	✓		✓
EB2229597-033	04-Oct-2022 00:00	FTG-A2-B1	✓		✓
EB2229597-034	04-Oct-2022 00:00	FTG-A2-V2_0.5	✓		✓
EB2229597-035	04-Oct-2022 00:00	FTG-A2-V2_1.0	✓		✓

			SOIL - EA055-103 Moisture Content	SOIL - EN84 Dry and Crush	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2229597-036	04-Oct-2022 00:00	FTG-A2-B2	✓		✓
EB2229597-037	04-Oct-2022 00:00	FTG-A2-V3_0.5	✓		✓
EB2229597-038	04-Oct-2022 00:00	FTG-A2-V3_1.0	✓		✓
EB2229597-039	04-Oct-2022 00:00	FTG-A2-B3	✓		✓
EB2229597-040	04-Oct-2022 00:00	FTG-A2-V4_0.5	✓		✓
EB2229597-041	04-Oct-2022 00:00	FTG-A2-V4_1.0	✓		✓
EB2229597-042	04-Oct-2022 00:00	FTG-A2-B4	✓		✓
EB2229597-043	04-Oct-2022 00:00	FTG-A2-V5_0.5	✓		✓
EB2229597-044	04-Oct-2022 00:00	FTG-A2-V5_1.0	✓		✓
EB2229597-045	04-Oct-2022 00:00	FTG-A2-B5	✓		✓
EB2229597-046	04-Oct-2022 00:00	FTG-A2-V6_0.5	✓		✓
EB2229597-047	04-Oct-2022 00:00	FTG-A2-V6_1.0	✓		✓
EB2229597-048	04-Oct-2022 00:00	FTG-A2-B6	✓		✓
EB2229597-049	04-Oct-2022 00:00	FTG-A2-V7_0.5	✓		✓
EB2229597-050	04-Oct-2022 00:00	FTG-A2-V7_1.0	✓		✓
EB2229597-051	04-Oct-2022 00:00	FTG-A2-B7	✓		✓
EB2229597-052	04-Oct-2022 00:00	FTG-A2-V8_0.5	✓		✓
EB2229597-053	04-Oct-2022 00:00	FTG-A2-V8_1.0	✓		✓
EB2229597-054	04-Oct-2022 00:00	FTG-A2-B8	✓		✓
EB2229597-057	04-Oct-2022 00:00	FTG-A2-B9	✓		✓
EB2229597-060	04-Oct-2022 00:00	FTG-A2-B10	✓		✓
EB2229597-061	04-Oct-2022 00:00	A3-V1	✓		✓
EB2229597-062	04-Oct-2022 00:00	A3-B1	✓		✓
EB2229597-063	04-Oct-2022 00:00	A3-V2	✓		✓
EB2229597-064	04-Oct-2022 00:00	A3-B2	✓		✓
EB2229597-065	04-Oct-2022 00:00	A3-V3	✓		✓
EB2229597-066	04-Oct-2022 00:00	A3-B3	✓		✓
EB2229597-067	04-Oct-2022 00:00	A3-V4	✓		✓
EB2229597-068	04-Oct-2022 00:00	BD01_0410	✓	✓	✓
EB2229597-069	04-Oct-2022 00:00	BD02_0410	✓		✓
EB2229597-070	04-Oct-2022 00:00	BD03_0410	✓		✓
EB2229597-071	04-Oct-2022 00:00	BD04_0410	✓		✓
EB2229597-072	04-Oct-2022 00:00	BD05_0410	✓		✓
EB2229597-073	04-Oct-2022 00:00	BD06_0410	✓		✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
EB2229597-074	04-Oct-2022 00:00	RB_0410	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

EPIC		
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au
INVOICES		
- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au
LABS		
- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	labs@epicenvironmental.com.au
LUKE AMIES		
- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au
MICHAEL KOWALCZYK		
- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

epic ENVIRONMENTAL

Chain of Custody Record

Project No:	BCL220033.01	Lab:	ALS
Project/Site:	CALLIDE	Lab Quote No:	BN/344/21 V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Luke Amies (lamies@epicenvironmental.com.au)	Date Results Required:	5 day TAT
Phone:	0447 661 021	Sample Disposal After:	
Page:	1 of 3		
Number of Eskies:			

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other	Potable Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrite and Nitrate (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	PFAS (EP231AN)	HOLD
1	FTG-A2-R1	10/04/2022 0:00	Soil				x																					x	
2	FTG-A2-R2	10/04/2022 0:00	Soil				x																					x	
3	FTG-A2-R3	10/04/2022 0:00	Soil				x																					x	
4	FTG-A2-R4	10/04/2022 0:00	Soil				x																					x	
5	FTG-A2-R5	10/04/2022 0:00	Soil				x																					x	
6	FTG-A2-R6	10/04/2022 0:00	Soil				x																					x	
7	FTG-A2-R7	10/04/2022 0:00	Soil				x																					x	
8	FTG-A2-R8	10/04/2022 0:00	Soil				x																					x	
9	FTG-A2-R9	10/04/2022 0:00	Soil				x																					x	
10	FTG-A2-R10	10/04/2022 0:00	Soil				x																					x	
11	FTG-A1-V1_0.5	10/04/2022 0:00	Soil				x																					x	
12	FTG-A1-V1_1.0	10/04/2022 0:00	Soil				x																					x	
13	FTG-A1-V2_0.5	10/04/2022 0:00	Soil				x																					x	
14	FTG-A1-V2_1.0	10/04/2022 0:00	Soil				x																					x	
15	FTG-A1-V3_0.5	10/04/2022 0:00	Soil				x																					x	
16	FTG-A1-V3_1.0	10/04/2022 0:00	Soil				x																					x	
17	FTG-A1-V4_0.5	10/04/2022 0:00	Soil				x																					x	
18	FTG-A1-V4_1.0	10/04/2022 0:00	Soil				x																					x	
19	FTG-A1-V5_0.5	10/04/2022 0:00	Soil				x																					x	
20	FTG-A1-V5_1.0	10/04/2022 0:00	Soil				x																					x	
21	FTG-A1-V6_0.5	10/04/2022 0:00	Soil				x																					x	
22	FTG-A1-V6_1.0	10/04/2022 0:00	Soil				x																					x	
23	FTG-A1-V7_0.5	10/04/2022 0:00	Soil				x																					x	
24	FTG-A1-V7_1.0	10/04/2022 0:00	Soil				x																					x	
25	FTG-A1-V8_0.5	10/04/2022 0:00	Soil				x																					x	
26	FTG-A1-V8_1.0	10/04/2022 0:00	Soil				x																					x	
27	FTG-A1-V9_0.5	10/04/2022 0:00	Soil				x																					x	
28	FTG-A1-V9_1.0	10/04/2022 0:00	Soil				x																					x	
29	FTG-A1-V10_0.5	10/04/2022 0:00	Soil				x																					x	
30	FTG-A1-V10_1.0	10/04/2022 0:00	Soil				x																					x	
31	FTG-A2-V1_0.5	10/04/2022 0:00	Soil				x																					x	

Environmental Division
Brisbane
Work Order Reference
EB2229597

Telephone : +61-7-3243 7222

SP 7/10/22 0850

epic ENVIRONMENTAL

Chain of Custody Record

Project No:	BCL220033.01	Lab:	ALS
Project/Site:	CALLIDE	Lab Quote No:	BN/344/21 V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Luke Amies (lamies@epicenvironmental.com.au)	Date Results Required:	5 day TAT
Phone:	0447 661 021	Sample Disposal After:	
Page:	1 of 3		
Number of Eskies:			

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other	Potable Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025H)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	SOIL: PFAS (EP231X)	HOLD
32	FTG-A2-V1_1.0	10/04/2022 0:00	Soil				x																					x	
33	FTG-A2-B1	10/04/2022 0:00	Soil				x																					x	
34	FTG-A2-V2_0.5	10/04/2022 0:00	Soil				x																					x	
35	FTG-A2-V2_1.0	10/04/2022 0:00	Soil				x																					x	
36	FTG-A2-B2	10/04/2022 0:00	Soil				x																					x	
37	FTG-A2-V3_0.5	10/04/2022 0:00	Soil				x																					x	
38	FTG-A2-V3_1.0	10/04/2022 0:00	Soil				x																					x	
39	FTG-A2-B3	10/04/2022 0:00	Soil				x																					x	
60	FTG-A2-V4_0.5	10/04/2022 0:00	Soil				x																					x	
61	FTG-A2-V4_1.0	10/04/2022 0:00	Soil				x																					x	
62	FTG-A2-B4	10/04/2022 0:00	Soil				x																					x	
63	FTG-A2-V5_0.5	10/04/2022 0:00	Soil				x																					x	
64	FTG-A2-V5_1.0	10/04/2022 0:00	Soil				x																					x	
65	FTG-A2-B5	10/04/2022 0:00	Soil				x																					x	
66	FTG-A2-V6_0.5	10/04/2022 0:00	Soil				x																					x	
67	FTG-A2-V6_1.0	10/04/2022 0:00	Soil				x																					x	
68	FTG-A2-B6	10/04/2022 0:00	Soil				x																					x	
69	FTG-A2-V7_0.5	10/04/2022 0:00	Soil				x																					x	
50	FTG-A2-V7_1.0	10/04/2022 0:00	Soil				x																					x	
51	FTG-A2-B7	10/04/2022 0:00	Soil				x																					x	
52	FTG-A2-V8_0.5	10/04/2022 0:00	Soil				x																					x	
53	FTG-A2-V8_1.0	10/04/2022 0:00	Soil				x																					x	
54	FTG-A2-B8	10/04/2022 0:00	Soil				x																					x	
~~55~~	FTG-A2-V9_0.5 SNR	10/04/2022 0:00	Soil				x																					x	
56	FTG-A2-V9_1.0 SNR	10/04/2022 0:00	Soil				x																					x	
57	FTG-A2-B9	10/04/2022 0:00	Soil				x																					x	
~~58~~	FTG-A2-V10_0.5 SNR	10/04/2022 0:00	Soil				x																					x	
~~59~~	FTG-A2-V10_1.0 SNR	10/04/2022 0:00	Soil				x																					x	
60	FTG-A2-B10	10/04/2022 0:00	Soil				x																					x	
61	A3-V1	10/04/2022 0:00	Soil				x																					x	
62	A3-B1	10/04/2022 0:00	Soil				x																					x	

SP 7/10/22 0850

Chain of Custody Record

Project No:	BCL220033.01
Project/Site:	CALLIDE
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Luke Amies (lamies@epicenvironmental.com.au)
Phone:	0447 661 021
Page:	1 of 3
Number of Eskies:	

Lab:	ALS
Lab Quote No:	BN/344/21 V3
Lab Batch No:	
Date Results Required:	5 day TAT
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other	Potable Water: pH (EA005P)	Potable Water: EC (EA010P)	Potable Water: TDS - Standard (EA015H)	Potable Water: Reactive P (EK071G)	Potable Water: Major Anions/Cations (NT-01 and NT02A)	Potable Water: Ionic Balance (EN055-PG)	Potable Water: PFAS Supper Ultra Trace Long Suite (EP231X-[illegible])	Bore Water: pH (EA005P)	Bore Water: EC (EA010P)	Bore Water: TDS - Standard (EA015H)	Bore Water: Suspended Solids - Low Level (EA025H)	Bore Water: Ammonia (EK055G)	Bore Water: Reactive P (EK071G)	Bore Water: Nitrate and Nitrite (NT-04)	Bore Water: Major Anions/Cations (NT-01 and NT02A)	Bore Water: Ionic Balance (EN055-PG)	Bore Water: Total Metals (Fe and Mn) (EG020T)	Bore Water: PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	SOIL: PFAS (EP231M)	HOLD
63	A3-V2	10/04/2022 0:00	Soil				x																					x	
64	A3-B2	10/04/2022 0:00	Soil				x																					x	
65	A3-V3	10/04/2022 0:00	Soil				x																					x	
66	A3-B3	10/04/2022 0:00	Soil				x																					x	
67	A3-V4	10/04/2022 0:00	Soil				x																					x	
69	BD01_0410	10/04/2022 0:00	Soil				x																					x	
69	BD02_0410	10/04/2022 0:00	Soil				x																					x	
70	BD03_0410	10/04/2022 0:00	Soil				x																					x	
71	BD04_0410	10/04/2022 0:00	Soil				x																					x	
72	BD05_0410	10/04/2022 0:00	Soil				x																					x	
73	BD06_0410	10/04/2022 0:00	Soil				x																					x	
—	SD01_0410	10/04/2022 0:00	Soil																										
—	SD02_0410	10/04/2022 0:00	Soil																										
—	SD03_0410	10/04/2022 0:00	Soil																										
—	SD04_0410	10/04/2022 0:00	Soil																										
—	SD05_0410	10/04/2022 0:00	Soil																										
—	SD06_0410	10/04/2022 0:00	Soil																										
74	SD RB-0410		Wate				2								X														
							73	TOTALS																				73	

Please forward to Eurofins MGT (separate COC provided).

Relinquished By:			
~~Michael Kowalczyk~~	LA	JL	05-Oct-22
NAME	SIGNATURE	DATE	

Received By	SP	7/10/22	0850
SIGNATURE		DATE	

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES:

email mkowalczyk@epicenvironmental.com.au
email lamies@epicenvironmental.com.au
email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2229632**	Page	: 1 of 17
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 11-Oct-2022 12:20
Order number	: ----	Date Analysis Commenced	: 12-Oct-2022
C-O-C number	: ----	Issue Date	: 24-Oct-2022 12:05
Sampler	: LUKE AMIES		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 33		
No. of samples analysed	: 33		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X PFAS: Samples "FOT-A2-V6_1.0" and "FOT-A2-V11_1.0" show poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- EP231X PFAS: The LOR of particular analytes have been raised due to sample matrix interferences.
- EP231X PFAS: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly and surrogate recoveries not determined.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FOT-A1-V1_0.5	FOT-A1-V1_1.0	FOT-A1-V2-0.5	FOT-A1-V2_1.0	FOT-A2-V1_0.5
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
					EB2229632-001	EB2229632-002	EB2229632-003	EB2229632-004	EB2229632-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**4.1**	**8.0**	**16.4**	**17.7**	**15.1**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	**0.0012**	<0.0002	<0.0010
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	**0.0110**	**0.0008**	**0.0023**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0003**	**0.0005**	**0.120**	**0.0882**	**0.150**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	**0.0013**	**0.0014**	**0.0028**	**0.0106**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0119**	**0.0917**	**0.0012**	**0.0229**	**0.791**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	**0.002**	<0.001	<0.005
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0004**	**0.0009**	**0.0023**	**0.0018**	**0.0013**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0003**	**0.0005**	**0.0116**	**0.0042**	**0.0106**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	**0.0012**	**0.0008**	**0.0032**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0008**	**0.0027**	**0.0027**	**0.0148**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0015**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0024
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0024

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A1-V1_0.5	FOT-A1-V1_1.0	FOT-A1-V2-0.5	FOT-A1-V2_1.0	FOT-A2-V1_0.5
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229632-001	EB2229632-002	EB2229632-003	EB2229632-004	EB2229632-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0024
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0024
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0024
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0129**	**0.0957**	**0.155**	**0.124**	**0.985**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0122**	**0.0922**	**0.121**	**0.111**	**0.941**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0129**	**0.0944**	**0.142**	**0.121**	**0.971**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	**133**	**113**	**109**	**Not Determined**
13C8-PFOA	----	0.0002	%		**114**	**104**	**99.0**	**102**	**Not Determined**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A2-V1_1.0	FOT-A2-V2_0.5	FOT-A2-V2_1.0	FOT-A2-V3_0.5	FOT-A2-V3_1.0
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229632-006	EB2229632-007	EB2229632-008	EB2229632-009	EB2229632-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**13.1**	**12.3**	**10.3**	**12.6**	**12.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0005	<0.0002	<0.0010	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0009**	<0.0002	<0.0010	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0668**	**0.0081**	**0.0040**	**0.0004**	**0.0029**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0033**	**0.0004**	<0.0010	<0.0002	**0.0002**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.544**	**0.0985**	**0.586**	**0.0115**	**0.104**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0005	**0.0032**	<0.0018	**0.0029**	**0.0070**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.002	<0.001	<0.005	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0005	**0.0003**	<0.0010	**0.0003**	**0.0005**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0029**	**0.0006**	<0.0010	**0.0004**	**0.0006**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0009**	**0.0004**	<0.0010	**0.0003**	**0.0003**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0073**	**0.0006**	<0.0010	**0.0002**	**0.0002**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0005	**0.0005**	<0.0010	**0.0002**	**0.0004**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0005	<0.0002	<0.0010	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0005	<0.0002	<0.0010	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0005	<0.0002	<0.0010	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0005	<0.0002	<0.0010	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0012	<0.0005	<0.0024	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		**0.0016**	<0.0002	<0.0010	<0.0002	**0.0011**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0012	<0.0005	<0.0024	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A2-V1_1.0	FOT-A2-V2_0.5	FOT-A2-V2_1.0	FOT-A2-V3_0.5	FOT-A2-V3_1.0
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229632-006	EB2229632-007	EB2229632-008	EB2229632-009	EB2229632-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0012	<0.0005	<0.0024	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0012	<0.0005	<0.0024	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0012	<0.0005	<0.0024	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0005	<0.0002	<0.0010	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0005	<0.0002	<0.0010	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.628**	**0.113**	**0.590**	**0.0162**	**0.117**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.611**	**0.107**	**0.590**	**0.0119**	**0.107**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.622**	**0.108**	**0.590**	**0.0131**	**0.108**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**120**	**114**	**Not Determined**	**120**	**102**
13C8-PFOA	----	0.0002	%		**100**	**104**	**Not Determined**	**99.5**	**106**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FOT-A2-V4_0.5	FOT-A2-V4_1.0	FOT-A2-V5_0.5	FOT-A2-V5_1.0	FOT-A2-V6_0.5
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
					EB2229632-011	EB2229632-012	EB2229632-013	EB2229632-014	EB2229632-015
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**9.1**	**5.6**	**15.3**	**7.1**	**6.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	**0.0003**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0016**	**0.0084**	**0.0112**	**0.0213**	**0.0124**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0010	**0.0034**	**0.0029**	**0.0098**	**0.0080**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.418**	**1.94**	**1.48**	**2.08**	**0.0427**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0010	<0.0105	<0.0042	**0.0092**	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.005	<0.012	<0.012	<0.012	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	**0.0002**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0010	**0.0076**	<0.0024	**0.0063**	**0.0007**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	**0.0071**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0010	**0.0029**	<0.0024	**0.0071**	**0.0075**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0025	<0.0062	<0.0061	<0.0061	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		**0.0021**	**0.0159**	**0.0058**	**0.0124**	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0025	<0.0062	<0.0061	<0.0061	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A2-V4_0.5	FOT-A2-V4_1.0	FOT-A2-V5_0.5	FOT-A2-V5_1.0	FOT-A2-V6_0.5
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229632-011	EB2229632-012	EB2229632-013	EB2229632-014	EB2229632-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0025	<0.0062	<0.0061	<0.0061	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0025	<0.0062	<0.0061	<0.0061	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0025	<0.0062	<0.0061	<0.0061	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0010	<0.0025	<0.0024	<0.0024	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.422**	**1.98**	**1.50**	**2.15**	**0.0789**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.420**	**1.95**	**1.49**	**2.10**	**0.0551**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.420**	**1.96**	**1.49**	**2.11**	**0.0706**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**60.0**	**225**	**50.0**	**100**	**126**
13C8-PFOA	----	0.0002	%		**90.0**	**75.0**	**75.0**	**75.0**	**110**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FOT-A2-V6_1.0	FOT-A2-V7_0.5	FOT-A2-V7_1.0	FOT-A2-V8_0.5	FOT-A2-V8_1.0
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
					EB2229632-016	EB2229632-017	EB2229632-018	EB2229632-019	EB2229632-020
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**5.7**	**7.8**	**10.3**	**3.8**	**5.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0108**	**0.0004**	**0.0012**	**0.0004**	**0.0018**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0020**	<0.0002	**0.0008**	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0063**	**0.189**	**0.160**	**0.166**	**0.0792**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0009**	<0.0002	<0.0002	<0.0002	**0.0003**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0020**	<0.0002	<0.0002	<0.0002	**0.0003**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0026**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0043**	<0.0002	**0.0005**	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0006	<0.0006	<0.0006	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0006	<0.0006	<0.0006	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A2-V6_1.0	FOT-A2-V7_0.5	FOT-A2-V7_1.0	FOT-A2-V8_0.5	FOT-A2-V8_1.0
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229632-016	EB2229632-017	EB2229632-018	EB2229632-019	EB2229632-020
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0006	<0.0006	<0.0006	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0006	<0.0006	<0.0006	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0006	<0.0006	<0.0006	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0293**	**0.189**	**0.162**	**0.166**	**0.0816**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0171**	**0.189**	**0.161**	**0.166**	**0.0810**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0269**	**0.189**	**0.162**	**0.166**	**0.0816**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**82.5**	**125**	**80.0**	**85.0**	**85.5**
13C8-PFOA	----	0.0002	%		**84.5**	**95.0**	**90.0**	**92.5**	**91.0**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FOT-A2-V9_0.5	FOT-A2-V9_1.0	FOT-A2-V10_0.5	FOT-A2-V10_1.0	FOT-A2-V11_0.5
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
					EB2229632-021	EB2229632-022	EB2229632-023	EB2229632-024	EB2229632-025
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**11.7**	**11.1**	**10.8**	**12.2**	**9.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	**0.0011**	<0.0002	**0.0003**	<0.0010
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	**0.0030**	**0.0003**	**0.0016**	<0.0010
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0136**	**0.205**	**0.0453**	**0.0198**	**0.0231**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0030**	**0.0093**	**0.0028**	<0.0002	**0.0101**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.175**	**0.244**	**0.0551**	**0.0016**	**0.714**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.005
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0008**	**0.0018**	**0.0004**	**0.0003**	<0.0010
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0009**	**0.0014**	**0.0009**	**0.0020**	<0.0010
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0008**	**0.0013**	**0.0004**	**0.0002**	<0.0010
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0026**	**0.0115**	**0.0027**	<0.0002	**0.0037**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0006	<0.0006	<0.0005	<0.0005	<0.0025
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0006	<0.0006	<0.0005	<0.0005	<0.0025

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A2-V9_0.5	FOT-A2-V9_1.0	FOT-A2-V10_0.5	FOT-A2-V10_1.0	FOT-A2-V11_0.5
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229632-021	EB2229632-022	EB2229632-023	EB2229632-024	EB2229632-025
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0006	<0.0006	<0.0005	<0.0005	<0.0025
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0006	<0.0006	<0.0005	<0.0005	<0.0025
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0006	<0.0006	<0.0005	<0.0005	<0.0025
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.197**	**0.478**	**0.108**	**0.0258**	**0.751**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.189**	**0.449**	**0.100**	**0.0214**	**0.737**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.194**	**0.466**	**0.105**	**0.0242**	**0.741**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**102**	**80.0**	**98.0**	**91.5**	**Not Determined**
13C8-PFOA	----	0.0002	%		**95.0**	**97.5**	**101**	**108**	**Not Determined**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FOT-A2-V11_1.0	FOT-A2-V12_0.5	FOT-A2-V12_1.0	FOT-A2-V13_0.5	FOT-A2-V13_1.0
			Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2229632-026	EB2229632-027	EB2229632-028	EB2229632-029	EB2229632-030
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**8.2**	**16.2**	**14.5**	**12.1**	**11.8**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	**0.0843**	**0.0872**	<0.0025	<0.0010
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	**0.0014**	**0.0866**	**0.152**	<0.0025	**0.0049**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0356**	**0.681**	**0.383**	**0.248**	**0.216**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	**0.0154**	**0.0136**	**0.0009**	**0.0907**	**0.0834**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.469**	**0.243**	**0.0066**	**1.74**	**0.306**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	**0.027**	**0.008**	<0.012	<0.002
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0005	**0.0425**	**0.0231**	<0.0025	**0.0005**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0024**	**0.105**	**0.136**	**0.0043**	**0.0137**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0005	**0.0114**	**0.0128**	<0.0025	**0.0006**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	**0.0108**	**0.0225**	**0.0030**	**0.0618**	**0.108**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0013	<0.0024	<0.0012	<0.0063	<0.0012
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0013	<0.0024	<0.0012	<0.0063	<0.0012

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A2-V11_1.0	FOT-A2-V12_0.5	FOT-A2-V12_1.0	FOT-A2-V13_0.5	FOT-A2-V13_1.0
				Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2229632-026	EB2229632-027	EB2229632-028	EB2229632-029	EB2229632-030
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0013	<0.0024	<0.0012	<0.0063	<0.0012
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0013	<0.0024	<0.0012	<0.0063	<0.0012
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0013	<0.0024	<0.0012	<0.0063	<0.0012
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		**0.0007**	<0.0010	<0.0005	<0.0025	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0010	<0.0005	<0.0025	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.535**	**1.32**	**0.813**	**2.14**	**0.733**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.505**	**0.924**	**0.390**	**1.99**	**0.522**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.518**	**1.22**	**0.660**	**2.05**	**0.645**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**100**	**Not Determined**	**85.0**	**Not Determined**	**90.0**
13C8-PFOA	----	0.0002	%		**90.0**	**Not Determined**	**85.0**	**Not Determined**	**85.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD01_0610	BD02_0610	BD03_0610	----	----
			Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2229632-031	EB2229632-032	EB2229632-033	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**16.3**	**10.6**	**8.5**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0026	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0026	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0122**	**0.0373**	**0.0006**	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	**0.0052**	**0.0029**	**0.0016**	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**1.41**	**0.0867**	**0.122**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0026	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.013	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0026	**0.0003**	**0.0010**	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0028**	**0.0006**	**0.0004**	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0026	**0.0003**	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0026	**0.0025**	**0.0010**	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0026	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0026	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0026	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0026	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0026	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0064	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	**0.0061**	<0.0002	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0064	<0.0005	<0.0005	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD01_0610	BD02_0610	BD03_0610	----	----
			Sampling date / time	06-Oct-2022 00:00	06-Oct-2022 00:00	06-Oct-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2229632-031	EB2229632-032	EB2229632-033	--------	--------
				Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0064	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0064	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0064	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0026	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0026	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0026	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0026	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0026	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0026	<0.0005	<0.0005	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**1.44**	**0.131**	**0.127**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**1.42**	**0.124**	**0.123**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**1.42**	**0.128**	**0.125**	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**Not Determined**	**86.5**	**97.0**	----	----
13C8-PFOA	----	0.0002	%	**Not Determined**	**91.0**	**99.0**	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2229632**	Page	: 1 of 11
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 11-Oct-2022
Order number	: ----	Date Analysis Commenced	: 12-Oct-2022
C-O-C number	: ----	Issue Date	: 24-Oct-2022
Sampler	: LUKE AMIES		
Site	: ----		
Quote number	: BN/344/21 V3		
No. of samples received	: 33		
No. of samples analysed	: 33		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Inorganics, Stafford, QLD
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4633642)									
EB2229393-001	Anonymous	EA055: Moisture Content	----	0.1	%	8.3	8.8	6.4	0% - 20%
EB2229632-006	FOT-A2-V1_1.0	EA055: Moisture Content	----	0.1	%	13.1	13.7	4.4	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4633644)									
EB2229632-016	FOT-A2-V6_1.0	EA055: Moisture Content	----	0.1	%	5.7	6.2	7.8	0% - 20%
EB2229632-026	FOT-A2-V11_1.0	EA055: Moisture Content	----	0.1	%	8.2	8.3	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4633641)									
EB2229393-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0009	0.0007	28.4	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0006	0.0005	23.1	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2229632-006	FOT-A2-V1_1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0009	0.0008	13.3	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0668	0.0594	11.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0033	0.0029	14.8	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.544	0.455	17.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4633643)									
EB2229632-016	FOT-A2-V6_1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0004	0.0007	46.1	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0108	# 0.0178	48.2	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0020	0.0032	46.5	0% - 50%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4633643) - continued									
EB2229632-016	FOT-A2-V6_1.0	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0063	# 0.0113	56.5	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2229632-026	FOT-A2-V11_1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	<0.0010	65.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0014	0.0010	27.5	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0356	# 0.0274	25.9	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0154	# 0.0124	21.4	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.469	# 0.374	22.5	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4633641)									
EB2229393-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2229632-006	FOT-A2-V1_1.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0029	0.0026	12.5	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0009	0.0007	28.6	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0073	0.0061	17.9	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	<0.002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4633643)									
EB2229632-016	FOT-A2-V6_1.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0009	0.0015	51.4	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0020	# 0.0034	50.2	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0026	# 0.0046	55.8	0% - 20%
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0043	# 0.0074	52.9	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4633643) - continued									
EB2229632-016	FOT-A2-V6_1.0	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2229632-026	FOT-A2-V11_1.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0024	0.0020	20.2	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0108	# 0.0086	21.9	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0013	<0.0013	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	<0.002	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4633641)									
EB2229393-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229632-006	FOT-A2-V1_1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0016	0.0015	7.4	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4633643)									
EB2229632-016	FOT-A2-V6_1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229632-026	FOT-A2-V11_1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0013	<0.0013	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0013	<0.0013	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0013	<0.0013	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0013	<0.0013	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4633641)									
EB2229393-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229632-006	FOT-A2-V1_1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4633641) - continued									
EB2229632-006	FOT-A2-V1_1.0	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4633643)									
EB2229632-016	FOT-A2-V6_1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2229632-026	FOT-A2-V11_1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0007	<0.0005	26.9	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4633641)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	100	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	100	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	88.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	104	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	97.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	104	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4633643)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	98.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	103	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	86.9	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	102	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	88.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	85.8	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4633641)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	95.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.6	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4633643)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	85.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	64.0	136

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4633643) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.3	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4633641)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.0	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4633643)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4633641)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	94.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	99.6	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	87.9	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	100	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4633643)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	88.0	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	87.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	92.1	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	88.3	54.8	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4633641)							
EB2229393-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	103	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	89.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	106	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	90.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	88.3	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4633643)							
EB2229632-017	FOT-A2-V7_0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	72.7	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	89.7	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	78.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	81.9	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	87.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4633641)							
EB2229393-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	89.7	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	93.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	93.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	95.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	92.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	104	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	110	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	99.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	102	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	101	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4633643)							
EB2229632-017	FOT-A2-V7_0.5	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	78.4	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	86.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	78.0	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	86.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	92.0	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	88.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	98.0	69.0	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4633643) - continued							
EB2229632-017	FOT-A2-V7_0.5	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	90.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	110	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	86.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	86.5	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4633641)							
EB2229393-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	102	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	112	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	95.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	98.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	96.8	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4633643)							
EB2229632-017	FOT-A2-V7_0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	84.0	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	81.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	91.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	93.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	92.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	74.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	64.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4633641)							
EB2229393-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	94.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	113	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	92.9	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	121	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4633643)							
EB2229632-017	FOT-A2-V7_0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	79.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	76.3	64.0	140

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4633643) - continued							
EB2229632-017	FOT-A2-V7_0.5	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	95.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	83.3	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2229632**	Page	: 1 of 8
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 11-Oct-2022
Site	: ----	Issue Date	: 24-Oct-2022
Sampler	: LUKE AMIES	No. of samples received	: 33
Order number	: ----	No. of samples analysed	: 33

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2229632--016	FOT-A2-V6_1.0	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	48.2 %	0% - 20%	**RPD exceeds LOR based limits**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2229632--026	FOT-A2-V11_1.0	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	25.9 %	0% - 20%	**RPD exceeds LOR based limits**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2229632--026	FOT-A2-V11_1.0	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	21.4 %	0% - 20%	**RPD exceeds LOR based limits**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2229632--016	FOT-A2-V6_1.0	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	56.5 %	0% - 20%	**RPD exceeds LOR based limits**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2229632--026	FOT-A2-V11_1.0	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	22.5 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EB2229632--016	FOT-A2-V6_1.0	**Perfluorohexanoic acid (PFHxA)**	307-24-4	50.2 %	0% - 50%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EB2229632--016	FOT-A2-V6_1.0	**Perfluoroheptanoic acid (PFHpA)**	375-85-9	55.8 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EB2229632--016	FOT-A2-V6_1.0	**Perfluorooctanoic acid (PFOA)**	335-67-1	52.9 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EB2229632--026	FOT-A2-V11_1.0	**Perfluorooctanoic acid (PFOA)**	335-67-1	21.9 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2229632--017	FOT-A2-V7_0.5	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP231S: PFAS Surrogate	EB2229632-011	FOT-A2-V4_0.5	**13C4-PFOS**	----	60.0 %	76.0-136 %	**Recovery less than lower data quality objective**
EP231S: PFAS Surrogate	EB2229632-012	FOT-A2-V4_1.0	**13C4-PFOS**	----	225 %	76.0-136 %	**Recovery greater than upper data quality objective**
EP231S: PFAS Surrogate	EB2229632-013	FOT-A2-V5_0.5	**13C4-PFOS**	----	50.0 %	76.0-136 %	**Recovery less than lower data quality objective**
EP231S: PFAS Surrogate	EB2229632-012	FOT-A2-V4_1.0	**13C8-PFOA**	----	75.0 %	78.1-131 %	**Recovery less than lower data quality objective**
EP231S: PFAS Surrogate	EB2229632-013	FOT-A2-V5_0.5	**13C8-PFOA**	----	75.0 %	78.1-131 %	**Recovery less than lower data quality objective**

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP231S: PFAS Surrogate	EB2229632-014	FOT-A2-V5_1.0	**13C8-PFOA**	----	75.0 %	78.1-131 %	**Recovery less than lower data quality objective**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
FOT-A1-V1_0.5, FOT-A1-V1_1.0, FOT-A1-V2-0.5, FOT-A1-V2_1.0, FOT-A2-V1_0.5, FOT-A2-V1_1.0, FOT-A2-V2_0.5, FOT-A2-V2_1.0, FOT-A2-V3_0.5, FOT-A2-V3_1.0, FOT-A2-V4_0.5, FOT-A2-V4_1.0, FOT-A2-V5_0.5, FOT-A2-V5_1.0, FOT-A2-V6_0.5, FOT-A2-V6_1.0, BD01_0610, FOT-A2-V7_0.5, FOT-A2-V7_1.0, FOT-A2-V8_0.5, FOT-A2-V8_1.0, FOT-A2-V9_0.5, FOT-A2-V9_1.0, FOT-A2-V10_0.5, FOT-A2-V10_1.0, FOT-A2-V11_0.5, FOT-A2-V11_1.0, FOT-A2-V12_0.5, FOT-A2-V12_1.0, FOT-A2-V13_0.5, FOT-A2-V13_1.0, BD02_0610, BD03_0610	**06-Oct-2022**	**----**	----	----	**12-Oct-2022**	20-Oct-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FOT-A1-V1_0.5, FOT-A1-V1_1.0, FOT-A1-V2-0.5, FOT-A1-V2_1.0, FOT-A2-V1_0.5, FOT-A2-V1_1.0, FOT-A2-V2_0.5, FOT-A2-V2_1.0, FOT-A2-V3_0.5, FOT-A2-V3_1.0, FOT-A2-V4_0.5, FOT-A2-V4_1.0, FOT-A2-V5_0.5, FOT-A2-V5_1.0, FOT-A2-V6_0.5, FOT-A2-V6_1.0, BD01_0610, FOT-A2-V7_0.5, FOT-A2-V7_1.0, FOT-A2-V8_0.5, FOT-A2-V8_1.0, FOT-A2-V9_0.5, FOT-A2-V9_1.0, FOT-A2-V10_0.5, FOT-A2-V10_1.0, FOT-A2-V11_0.5, FOT-A2-V11_1.0, FOT-A2-V12_0.5, FOT-A2-V12_1.0, FOT-A2-V13_0.5, FOT-A2-V13_1.0, BD02_0610, BD03_0610	**06-Oct-2022**	**18-Oct-2022**	04-Apr-2023	✓	**19-Oct-2022**	27-Nov-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
FOT-A1-V1_0.5, FOT-A1-V1_1.0, FOT-A1-V2-0.5, FOT-A1-V2_1.0, FOT-A2-V1_0.5, FOT-A2-V1_1.0, FOT-A2-V2_0.5, FOT-A2-V2_1.0, FOT-A2-V3_0.5, FOT-A2-V3_1.0, FOT-A2-V4_0.5, FOT-A2-V4_1.0, FOT-A2-V5_0.5, FOT-A2-V5_1.0, FOT-A2-V6_0.5, FOT-A2-V6_1.0, BD01_0610, FOT-A2-V7_0.5, FOT-A2-V7_1.0, FOT-A2-V8_0.5, FOT-A2-V8_1.0, FOT-A2-V9_0.5, FOT-A2-V9_1.0, FOT-A2-V10_0.5, FOT-A2-V10_1.0, FOT-A2-V11_0.5, FOT-A2-V11_1.0, FOT-A2-V12_0.5, FOT-A2-V12_1.0, FOT-A2-V13_0.5, FOT-A2-V13_1.0, BD02_0610, BD03_0610	**06-Oct-2022**	**18-Oct-2022**	04-Apr-2023	✓	**19-Oct-2022**	27-Nov-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
FOT-A1-V1_0.5, FOT-A1-V1_1.0, FOT-A1-V2-0.5, FOT-A1-V2_1.0, FOT-A2-V1_0.5, FOT-A2-V1_1.0, FOT-A2-V2_0.5, FOT-A2-V2_1.0, FOT-A2-V3_0.5, FOT-A2-V3_1.0, FOT-A2-V4_0.5, FOT-A2-V4_1.0, FOT-A2-V5_0.5, FOT-A2-V5_1.0, FOT-A2-V6_0.5, FOT-A2-V6_1.0, BD01_0610, FOT-A2-V7_0.5, FOT-A2-V7_1.0, FOT-A2-V8_0.5, FOT-A2-V8_1.0, FOT-A2-V9_0.5, FOT-A2-V9_1.0, FOT-A2-V10_0.5, FOT-A2-V10_1.0, FOT-A2-V11_0.5, FOT-A2-V11_1.0, FOT-A2-V12_0.5, FOT-A2-V12_1.0, FOT-A2-V13_0.5, FOT-A2-V13_1.0, BD02_0610, BD03_0610	**06-Oct-2022**	**18-Oct-2022**	04-Apr-2023	✓	**19-Oct-2022**	27-Nov-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FOT-A1-V1_0.5, FOT-A1-V1_1.0, FOT-A1-V2-0.5, FOT-A1-V2_1.0, FOT-A2-V1_0.5, FOT-A2-V1_1.0, FOT-A2-V2_0.5, FOT-A2-V2_1.0, FOT-A2-V3_0.5, FOT-A2-V3_1.0, FOT-A2-V4_0.5, FOT-A2-V4_1.0, FOT-A2-V5_0.5, FOT-A2-V5_1.0, FOT-A2-V6_0.5, FOT-A2-V6_1.0, BD01_0610, FOT-A2-V7_0.5, FOT-A2-V7_1.0, FOT-A2-V8_0.5, FOT-A2-V8_1.0, FOT-A2-V9_0.5, FOT-A2-V9_1.0, FOT-A2-V10_0.5, FOT-A2-V10_1.0, FOT-A2-V11_0.5, FOT-A2-V11_1.0, FOT-A2-V12_0.5, FOT-A2-V12_1.0, FOT-A2-V13_0.5, FOT-A2-V13_1.0, BD02_0610, BD03_0610	**06-Oct-2022**	**18-Oct-2022**	04-Apr-2023	✓	**19-Oct-2022**	27-Nov-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
FOT-A1-V1_0.5, FOT-A1-V1_1.0, FOT-A1-V2-0.5, FOT-A1-V2_1.0, FOT-A2-V1_0.5, FOT-A2-V1_1.0, FOT-A2-V2_0.5, FOT-A2-V2_1.0, FOT-A2-V3_0.5, FOT-A2-V3_1.0, FOT-A2-V4_0.5, FOT-A2-V4_1.0, FOT-A2-V5_0.5, FOT-A2-V5_1.0, FOT-A2-V6_0.5, FOT-A2-V6_1.0, BD01_0610, FOT-A2-V7_0.5, FOT-A2-V7_1.0, FOT-A2-V8_0.5, FOT-A2-V8_1.0, FOT-A2-V9_0.5, FOT-A2-V9_1.0, FOT-A2-V10_0.5, FOT-A2-V10_1.0, FOT-A2-V11_0.5, FOT-A2-V11_1.0, FOT-A2-V12_0.5, FOT-A2-V12_1.0, FOT-A2-V13_0.5, FOT-A2-V13_1.0, BD02_0610, BD03_0610	**06-Oct-2022**	**18-Oct-2022**	04-Apr-2023	✓	**19-Oct-2022**	27-Nov-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	38	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2229632**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: MICHAEL KOWALCZYK	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: mkowalczyk@epicenvironmental.com.au	E-mail	: k.hiltonbarber@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BCL220033.01 CALLIDE	Page	: 1 of 3
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: LUKE AMIES		

Dates

Date Samples Received	: 11-Oct-2022 12:20	Issue Date	: 11-Oct-2022
Client Requested Due Date	: 24-Oct-2022	Scheduled Reporting Date	: **24-Oct-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 3.4°C - Ice present
Receipt Detail	: Medium Esky	No. of samples received / analysed	: 33 / 33

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- ***Samples were originally received by ALS Gladstone on 06/10/2022 (7°C), and forwarded to ALS Brisbane for analysis.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **Samples "SD01", "SD02", and "SD03" have been forwarded to Eurofins, as requested. Please note that this will incur a freight forwarding fee.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2229632-001	06-Oct-2022 00:00	FOT-A1-V1_0.5	✓	✓
EB2229632-002	06-Oct-2022 00:00	FOT-A1-V1_1.0	✓	✓
EB2229632-003	06-Oct-2022 00:00	FOT-A1-V2-0.5	✓	✓
EB2229632-004	06-Oct-2022 00:00	FOT-A1-V2_1.0	✓	✓
EB2229632-005	06-Oct-2022 00:00	FOT-A2-V1_0.5	✓	✓
EB2229632-006	06-Oct-2022 00:00	FOT-A2-V1_1.0	✓	✓
EB2229632-007	06-Oct-2022 00:00	FOT-A2-V2_0.5	✓	✓
EB2229632-008	06-Oct-2022 00:00	FOT-A2-V2_1.0	✓	✓
EB2229632-009	06-Oct-2022 00:00	FOT-A2-V3_0.5	✓	✓
EB2229632-010	06-Oct-2022 00:00	FOT-A2-V3_1.0	✓	✓
EB2229632-011	06-Oct-2022 00:00	FOT-A2-V4_0.5	✓	✓
EB2229632-012	06-Oct-2022 00:00	FOT-A2-V4_1.0	✓	✓
EB2229632-013	06-Oct-2022 00:00	FOT-A2-V5_0.5	✓	✓
EB2229632-014	06-Oct-2022 00:00	FOT-A2-V5_1.0	✓	✓
EB2229632-015	06-Oct-2022 00:00	FOT-A2-V6_0.5	✓	✓
EB2229632-016	06-Oct-2022 00:00	FOT-A2-V6_1.0	✓	✓
EB2229632-017	06-Oct-2022 00:00	FOT-A2-V7_0.5	✓	✓
EB2229632-018	06-Oct-2022 00:00	FOT-A2-V7_1.0	✓	✓
EB2229632-019	06-Oct-2022 00:00	FOT-A2-V8_0.5	✓	✓
EB2229632-020	06-Oct-2022 00:00	FOT-A2-V8_1.0	✓	✓
EB2229632-021	06-Oct-2022 00:00	FOT-A2-V9_0.5	✓	✓
EB2229632-022	06-Oct-2022 00:00	FOT-A2-V9_1.0	✓	✓
EB2229632-023	06-Oct-2022 00:00	FOT-A2-V10_0.5	✓	✓
EB2229632-024	06-Oct-2022 00:00	FOT-A2-V10_1.0	✓	✓
EB2229632-025	06-Oct-2022 00:00	FOT-A2-V11_0.5	✓	✓
EB2229632-026	06-Oct-2022 00:00	FOT-A2-V11_1.0	✓	✓
EB2229632-027	06-Oct-2022 00:00	FOT-A2-V12_0.5	✓	✓
EB2229632-028	06-Oct-2022 00:00	FOT-A2-V12_1.0	✓	✓
EB2229632-029	06-Oct-2022 00:00	FOT-A2-V13_0.5	✓	✓
EB2229632-030	06-Oct-2022 00:00	FOT-A2-V13_1.0	✓	✓
EB2229632-031	06-Oct-2022 00:00	BD01_0610	✓	✓
EB2229632-032	06-Oct-2022 00:00	BD02_0610	✓	✓
EB2229632-033	06-Oct-2022 00:00	BD03_0610	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ESDAT REPORTS		
- *AU Certificate of Analysis - NATA (COA)	Email	epicenvironmental@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	epicenvironmental@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	epicenvironmental@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	epicenvironmental@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	epicenvironmental@esdat.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	epicenvironmental@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au
- EDI Format - XTab (XTAB)	Email	epicenvironmental@esdat.com.au
INVOICES		
- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au
LABS		
- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	labs@epicenvironmental.com.au
LUKE AMIES		
- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au
MICHAEL KOWALCZYK		
- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

epic ENVIRONMENTAL

JS 11/10/22 1220

Chain of Custody Record

Project No:	BCL220033.01	Lab:	ALS
Project/Site:	CALLIDE	Lab Quote No:	BN/344/21 V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Luke Amies (lamies@epicenvironmental.com.au)	Date Results Required:	5 day TAT
Phone:	0447 661 021	Sample Disposal After:	
Page:	1 of 2		
Number of Eskies:			

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-06)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TDF (EP040)	Potable Water	Bore Water	HOLD
	All																											X		
1	FOT-A1-V1_0.5	6/10/22	Soil				X																					X		
2	-A1-V1-1.0						X																					X		
3	-A1-V2-0.5						X																					X		
4	-A1-V2-1.0						X																					X		
5	FOT-A2-V1-0.5						X																					X		
6	A2-V1_1.0						X																					X		
7	A2-V2_0.5						X																					X		
8	A2-V2_1.0						X																					X		
9	A2-V3_0.5						X																					X		
10	A2-V3-1.0						X																					X		
11	A2-V4_0.5						X																					X		
12	A2-V4_1.0						X																					X		
13	A2-V5-0.5						X																					X		
14	A2-V5-1.0						X																					X		
15	A2-V6-0.5						X																					X		
16	A2-V6_1.0						X																					X		
17	A2-V7_0.5						X																					X		
18	A2-V7_1.0						X																					X		
19	A2-V8_0.5						X																					X		
20	A2-V8-1.0						X																					X		
21	A2-V9-0.5						X																					X		
22	A2-V9-1.0						X																					X		
23	A2-V10_0.5						X																					X		
24	A2-V10-1.0						X																					X		
25	A2-V11_0.5						X																					X		
26	A2-V11_1.0						X																					X		
27	A2-V12_0.5						X																					X		
28	A2-V12_1.0						X																					X		

Environmental Division
Brisbane
Work Order Reference
EB2229632

Telephone : +61-7-3243 7222

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Chain of Custody Record

Project No:	BCL220033.01	Lab:	ALS
Project/Site:	CALLIDE	Lab Quote No:	BN/344/21 V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Luke Amies (lamies@epicenvironmental.com.au)	Date Results Required:	5 day TAT
Phone:	0447 661 021	Sample Disposal After:	
Page:	2 of 3 2		
Number of Eskies:			

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Sugger Ultra Trace Long Suite (EP231X-SUT)	pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Sugger Ultra Trace Long Suite (EP231X-SUT)	TOPA (EP231X-LL (TOP)) + TOF (EP040)	PFAS (EP231x)	HOLD
29	FGT-A2-V13-0.5	6/10/22	Soil				X																					X	
30	FGT-A2-V13-1.0	↓	↓				X																					X	
31	BD01-0610						X																					X	
32	BD02-0610						X																					X	
33	BD03-0610						X																					X	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2232058**	Page	: 1 of 41
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 01-Nov-2022 09:45
Order number	: ----	Date Analysis Commenced	: 02-Nov-2022
C-O-C number	: ----	Issue Date	: 15-Nov-2022 13:38
Sampler	: MICHAEL KOWALCZYK		
Site	: CALLIDE		
Quote number	: BN/344/21 V3		
No. of samples received	: 94		
No. of samples analysed	: 92		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Keegan Mullane	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231X PFAS: Sample "FOT-A1-V10-0.5" shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection
- EP231X PFAS: Sample "FOT-A1-V11-0.5" shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EP231X PFAS: The LOR of particular analytes have been raised due to sample matrix interferences.
- EP231X PFAS: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly and surrogate recovery not determined.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	BD01_2710	BD02_2710	BD03_2710	BD04_2710	BD05_2710
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
					EB2232058-001	EB2232058-002	EB2232058-003	EB2232058-004	EB2232058-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**11.7**	**15.1**	**12.6**	**10.4**	**6.7**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0010	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0010	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0048**	**0.0003**	<0.0002	<0.0002	**0.0005**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0010	<0.0002	<0.0002	**0.0002**	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**1.01**	**0.0584**	**0.182**	**0.0148**	**0.0462**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0010	**0.0011**	<0.0002	<0.0002	**0.0003**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.005	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0016**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0138**	<0.0002	<0.0002	<0.0002	**0.0002**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0010	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0010	<0.0002	<0.0002	**0.0003**	**0.0002**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0010	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0010	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0010	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0010	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0010	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0025	<0.0005	<0.0006	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		**0.0020**	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0025	<0.0005	<0.0006	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD01_2710	BD02_2710	BD03_2710	BD04_2710	BD05_2710
			Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232058-001	EB2232058-002	EB2232058-003	EB2232058-004	EB2232058-005
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0025	<0.0005	<0.0006	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0025	<0.0005	<0.0006	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0025	<0.0005	<0.0006	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0010	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0010	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**1.03**	**0.0598**	**0.182**	**0.0153**	**0.0474**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**1.01**	**0.0587**	**0.182**	**0.0148**	**0.0467**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**1.03**	**0.0587**	**0.182**	**0.0151**	**0.0471**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**Not Determined**	**88.0**	**130**	**98.0**	**93.0**
13C8-PFOA	----	0.0002	%	**Not Determined**	**95.5**	**95.0**	**92.5**	**90.5**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	BD06_2710	BD07_2710	BD08_2710	FOT-A1-V03-0.5	FOT-A1-V03-1.0
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
					EB2232058-006	EB2232058-007	EB2232058-008	EB2232058-009	EB2232058-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**9.2**	**9.7**	**8.6**	**14.6**	**13.7**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0024**	**0.0008**	**0.0012**	**0.0068**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0010	**0.0002**	<0.0002	**0.0008**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0109**	**1.07**	**0.0578**	**0.0198**	**0.0200**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0030	**0.0007**	**0.0060**	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.005	<0.001	**0.001**	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0003**	**0.0015**	**0.0007**	**0.0019**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0002**	<0.0010	**0.0003**	**0.0014**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0010	**0.0003**	**0.0009**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0016**	**0.0041**	**0.0002**	**0.0004**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	**0.0030**	**0.0073**	**0.0002**	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	**0.0012**	**0.0016**	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0010	**0.0004**	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0025	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0025	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD06_2710	BD07_2710	BD08_2710	FOT-A1-V03-0.5	FOT-A1-V03-1.0
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-006	EB2232058-007	EB2232058-008	EB2232058-009	EB2232058-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0025	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0025	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0025	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0010	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0010	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	**0.0089**	**0.0014**	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	**0.0020**	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0114**	**1.09**	**0.0756**	**0.0326**	**0.0280**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0109**	**1.07**	**0.0586**	**0.0210**	**0.0268**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0114**	**1.08**	**0.0654**	**0.0264**	**0.0272**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**97.5**	**Not Determined**	**102**	**114**	**97.0**
13C8-PFOA	----	0.0002	%		**94.0**	**Not Determined**	**99.5**	**91.0**	**91.0**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FOT-A1-V04-0.5	FOT-A1-V04-1.0	FOT-A1-V05-0.5	FOT-A1-V05-1.0	FOT-A1-V06-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
					EB2232058-011	EB2232058-012	EB2232058-013	EB2232058-014	EB2232058-015
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**4.0**	**4.3**	**5.9**	**7.5**	**3.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0015**	**0.0012**	**0.0010**	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	**0.0007**	**0.0003**	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0147**	**0.0369**	**0.0468**	**0.0312**	**0.0043**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0018**	<0.0002	**0.0012**	**0.0002**	**0.0004**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0002**	**0.0002**	**0.0003**	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A1-V04-0.5	FOT-A1-V04-1.0	FOT-A1-V05-0.5	FOT-A1-V05-1.0	FOT-A1-V06-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-011	EB2232058-012	EB2232058-013	EB2232058-014	EB2232058-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0190**	**0.0390**	**0.0496**	**0.0314**	**0.0047**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0162**	**0.0381**	**0.0478**	**0.0312**	**0.0043**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0172**	**0.0383**	**0.0481**	**0.0312**	**0.0043**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**91.5**	**107**	**108**	**92.0**	**104**
13C8-PFOA	----	0.0002	%		**92.0**	**95.0**	**93.5**	**92.0**	**95.0**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FOT-A1-V06-1.0	FOT-A1-V07-0.5	FOT-A1-V07-1.0	FOT-A1-V08-0.5	FOT-A1-V09-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
					EB2232058-016	EB2232058-017	EB2232058-018	EB2232058-019	EB2232058-020
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**4.0**	**2.4**	**2.6**	**9.7**	**7.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0010**	**0.0037**	**0.0003**	<0.0010
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	**0.0016**	**0.0006**	<0.0010
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0314**	**0.0147**	**0.266**	**0.0795**	**0.561**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0023**	**0.0005**	**0.0140**	<0.0002	<0.0010
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.005
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	**0.0005**	<0.0002	<0.0010
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	**0.0008**	**0.0003**	<0.0010
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0006	<0.0005	<0.0024
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	**0.0010**	<0.0002	**0.0028**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0006	<0.0005	<0.0024

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A1-V06-1.0	FOT-A1-V07-0.5	FOT-A1-V07-1.0	FOT-A1-V08-0.5	FOT-A1-V09-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-016	EB2232058-017	EB2232058-018	EB2232058-019	EB2232058-020
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0006	<0.0005	<0.0024
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0006	<0.0005	<0.0024
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0006	<0.0005	<0.0024
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0010
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0010
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0337**	**0.0162**	**0.288**	**0.0807**	**0.564**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0314**	**0.0157**	**0.270**	**0.0798**	**0.561**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0314**	**0.0157**	**0.271**	**0.0801**	**0.561**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**114**	**97.0**	**128**	**107**	**Not Determined**
13C8-PFOA	----	0.0002	%		**89.5**	**84.5**	**97.5**	**94.0**	**Not Determined**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FOT-A1-V10-0.5	FOT-A1-V11-0.5	FOT-A1-V11-1.0	FOT-A1-V12-0.5	FOT-A1-V12-1.0
			Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232058-021	EB2232058-022	EB2232058-023	EB2232058-024	EB2232058-025
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**11.3**	**10.7**	**8.2**	**4.7**	**5.6**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	<0.0002	<0.0010	**0.0002**	<0.0025
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0005	**0.0002**	**0.0042**	**0.0002**	<0.0025
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0014**	**0.0036**	**0.0697**	**0.0037**	**0.0214**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0005	<0.0002	**0.0064**	**0.0002**	<0.0025
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.341**	**0.0404**	**0.712**	**0.0417**	**1.84**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	**0.0061**	**0.0049**	**0.0395**	**0.0128**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	<0.001	<0.005	<0.001	<0.012
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	**0.0007**	<0.0002	**0.0028**	<0.0002	<0.0025
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0041**	**0.0003**	**0.0157**	**0.0008**	**0.0175**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0005	<0.0002	**0.0015**	<0.0002	<0.0025
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0005	<0.0002	**0.0034**	**0.0003**	<0.0025
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	<0.0002	<0.0010	<0.0002	<0.0025
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0002	<0.0010	**0.0003**	<0.0025
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0002	<0.0010	**0.0012**	<0.0025
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0002	<0.0010	**0.0046**	<0.0025
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0002	<0.0010	<0.0005	<0.0025
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0012	<0.0005	<0.0025	<0.0005	<0.0062
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	**0.0007**	**0.0004**	<0.0010	**0.0016**	<0.0025
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0012	<0.0005	<0.0025	<0.0005	<0.0062

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A1-V10-0.5	FOT-A1-V11-0.5	FOT-A1-V11-1.0	FOT-A1-V12-0.5	FOT-A1-V12-1.0
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-021	EB2232058-022	EB2232058-023	EB2232058-024	EB2232058-025
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0012	<0.0005	<0.0025	<0.0005	<0.0062
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0012	<0.0005	<0.0025	<0.0005	<0.0062
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0012	<0.0005	<0.0025	<0.0005	<0.0062
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0005	<0.0002	<0.0010	<0.0002	<0.0025
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0005	<0.0002	<0.0010	<0.0002	<0.0025
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0025
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0025
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0025
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0025
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.348**	**0.0510**	**0.821**	**0.0943**	**1.89**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.342**	**0.0440**	**0.782**	**0.0454**	**1.86**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.347**	**0.0443**	**0.805**	**0.0467**	**1.88**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.0**	**116**	**Not Determined**	**94.0**	**100**
13C8-PFOA	----	0.0002	%		**95.0**	**96.0**	**Not Determined**	**99.0**	**100**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FOT-A1-V13-0.5	FOT-A3-V01-0.5	FOT-A3-V01-1.0	FOT-A3-V02-0.5	FOT-A3-V02-1.0
			Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232058-026	EB2232058-028	EB2232058-029	EB2232058-030	EB2232058-031
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**7.6**	**11.0**	**9.4**	**11.8**	**10.7**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0035**	<0.0002	<0.0002	**0.0038**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	**0.0025**	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0898**	**0.0132**	**0.0121**	**0.0085**	**0.0018**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	**0.0009**	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0002**	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	**0.0020**	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A1-V13-0.5	FOT-A3-V01-0.5	FOT-A3-V01-1.0	FOT-A3-V02-0.5	FOT-A3-V02-1.0
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-026	EB2232058-028	EB2232058-029	EB2232058-030	EB2232058-031
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0989**	**0.0132**	**0.0121**	**0.0132**	**0.0018**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0933**	**0.0132**	**0.0121**	**0.0123**	**0.0018**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0955**	**0.0132**	**0.0121**	**0.0129**	**0.0018**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**93.0**	**94.0**	**108**	**106**	**98.5**
13C8-PFOA	----	0.0002	%		**99.0**	**91.5**	**93.5**	**94.5**	**96.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FOT-A3-V03-0.5	FOT-A3-V03-1.0	FOT-A3-V04-0.5	FOT-A3-V04-1.0	FOT-A3-V05-0.5
			Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232058-032	EB2232058-033	EB2232058-034	EB2232058-035	EB2232058-036
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**10.0**	**12.5**	**7.8**	**7.9**	**10.5**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0019**	**0.0008**	**0.0009**	**0.0006**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	**0.0002**	<0.0002	**0.0004**	**0.0005**	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0444**	**0.0173**	**0.0488**	**0.0162**	**0.0445**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	**0.0008**	**0.0006**	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	**0.0003**	**0.0005**	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A3-V03-0.5	FOT-A3-V03-1.0	FOT-A3-V04-0.5	FOT-A3-V04-1.0	FOT-A3-V05-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-032	EB2232058-033	EB2232058-034	EB2232058-035	EB2232058-036
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0467**	**0.0189**	**0.0510**	**0.0178**	**0.0445**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0463**	**0.0181**	**0.0497**	**0.0168**	**0.0445**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0465**	**0.0181**	**0.0500**	**0.0173**	**0.0445**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**100**	**89.5**	**108**	**96.0**	**88.5**
13C8-PFOA	----	0.0002	%		**92.0**	**96.0**	**94.5**	**94.5**	**90.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FOT-A3-V05-1.0	FOT-A3-V06-0.5	FOT-A3-V06-1.0	FOT-A3-V07-0.5	FOT-A3-V07-1.0
			Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232058-037	EB2232058-038	EB2232058-039	EB2232058-040	EB2232058-041
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**11.6**	**6.5**	**8.6**	**3.9**	**3.6**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0003**	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0288**	**0.0117**	**0.0214**	**0.0035**	**0.0050**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0004	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	**0.0002**	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A3-V05-1.0	FOT-A3-V06-0.5	FOT-A3-V06-1.0	FOT-A3-V07-0.5	FOT-A3-V07-1.0
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-037	EB2232058-038	EB2232058-039	EB2232058-040	EB2232058-041
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0291**	**0.0119**	**0.0216**	**0.0035**	**0.0050**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0291**	**0.0119**	**0.0214**	**0.0035**	**0.0050**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0291**	**0.0119**	**0.0216**	**0.0035**	**0.0050**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**98.5**	**118**	**104**	**126**	**110**
13C8-PFOA	----	0.0002	%		**92.5**	**91.5**	**101**	**88.0**	**102**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FOT-A3-V08-0.5	FOT-A3-V08-1.0	FOT-A3-V09-0.5	FOT-A3-V09-1.0	FOT-A3-V10-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
					EB2232058-042	EB2232058-043	EB2232058-044	EB2232058-045	EB2232058-046
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**5.6**	**4.4**	**12.5**	**10.1**	**10.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	**0.0003**	**0.0007**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0016**	**0.0026**	**0.394**	**0.139**	**0.0391**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.002	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	**0.0002**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0006	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0006	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A3-V08-0.5	FOT-A3-V08-1.0	FOT-A3-V09-0.5	FOT-A3-V09-1.0	FOT-A3-V10-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-042	EB2232058-043	EB2232058-044	EB2232058-045	EB2232058-046
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0006	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0006	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0006	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0016**	**0.0026**	**0.394**	**0.139**	**0.0400**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0016**	**0.0026**	**0.394**	**0.139**	**0.0398**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0016**	**0.0026**	**0.394**	**0.139**	**0.0400**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**87.0**	**107**	**105**	**92.5**	**99.0**
13C8-PFOA	----	0.0002	%		**97.0**	**102**	**100**	**95.0**	**102**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FOT-A3-V10-1.0	FOT-A3-V11-0.5	FOT-A3-V11-1.0	FOT-A3-V12-0.5	FOT-A3-V12-1.0
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
					EB2232058-047	EB2232058-048	EB2232058-049	EB2232058-050	EB2232058-051
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**12.9**	**10.9**	**6.5**	**4.4**	**5.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0003**	**0.0009**	**0.0002**	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0583**	**0.0102**	**0.0174**	**0.0110**	**0.0125**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0014	<0.0005	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0009**	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0006**	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	**0.0005**	**0.0002**	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0004**	**0.0003**	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A3-V10-1.0	FOT-A3-V11-0.5	FOT-A3-V11-1.0	FOT-A3-V12-0.5	FOT-A3-V12-1.0
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-047	EB2232058-048	EB2232058-049	EB2232058-050	EB2232058-051
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0588**	**0.0137**	**0.0181**	**0.0110**	**0.0125**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0586**	**0.0111**	**0.0176**	**0.0110**	**0.0125**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0586**	**0.0135**	**0.0181**	**0.0110**	**0.0125**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**94.0**	**91.5**	**85.0**	**97.0**	**87.5**
13C8-PFOA	----	0.0002	%		**97.5**	**96.5**	**96.5**	**100**	**99.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FOT-A3-V13-0.5	FOT-A3-V13-1.0	FOT-A3-V14-0.5	FOT-A3-V14-1.0	FOT-A3-V15-0.5
			Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232058-052	EB2232058-053	EB2232058-054	EB2232058-055	EB2232058-056
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**19.7**	**4.1**	**4.3**	**4.6**	**7.3**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	**0.0004**	**0.0014**	**0.0007**	**0.0010**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	**0.0002**	<0.0002	<0.0005	**0.0006**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0022**	**0.0219**	**0.0960**	**0.254**	**0.376**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0010	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.002	<0.002
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	**0.0028**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	**0.0002**	<0.0005	**0.0022**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	**0.0003**	<0.0005	**0.0026**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	**0.0004**	**0.0010**	<0.0005	**0.0050**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	**0.0008**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0012	<0.0012
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0012	<0.0012

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A3-V13-0.5	FOT-A3-V13-1.0	FOT-A3-V14-0.5	FOT-A3-V14-1.0	FOT-A3-V15-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-052	EB2232058-053	EB2232058-054	EB2232058-055	EB2232058-056
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0012	<0.0012
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0012	<0.0012
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0012	<0.0012
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**0.0075**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**0.0034**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**0.0021**
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0022**	**0.0229**	**0.0989**	**0.255**	**0.404**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0022**	**0.0223**	**0.0974**	**0.255**	**0.377**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0022**	**0.0227**	**0.0989**	**0.255**	**0.400**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**89.5**	**91.5**	**115**	**110**	**120**
13C8-PFOA	----	0.0002	%		**94.0**	**93.5**	**101**	**100**	**95.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FOT-A3-V15-1.0	FOT-A3-V16-0.5	FOT-A3-V16-1.0	FOT-A3-V17-0.5	FOT-A3-V17-1.0
			Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232058-057	EB2232058-058	EB2232058-059	EB2232058-060	EB2232058-061
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**6.9**	**5.0**	**11.1**	**5.5**	**4.7**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	**0.0003**	<0.0002	**0.0007**	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0091**	**0.0004**	**0.0028**	**0.0004**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	**0.0026**	<0.0002	**0.0015**	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.177**	**0.0311**	**0.145**	**0.0310**	**0.0291**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	**0.0003**	**0.0004**	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	**0.009**	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	**0.0381**	<0.0002	<0.0002	**0.0006**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0154**	<0.0002	**0.0009**	**0.0004**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	**0.0016**	<0.0002	<0.0002	**0.0004**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	**0.0022**	<0.0002	**0.0004**	**0.0004**	**0.0002**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	**0.0006**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0006	<0.0005	<0.0006	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0006	<0.0005	<0.0006	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A3-V15-1.0	FOT-A3-V16-0.5	FOT-A3-V16-1.0	FOT-A3-V17-0.5	FOT-A3-V17-1.0
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-057	EB2232058-058	EB2232058-059	EB2232058-060	EB2232058-061
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0006	<0.0005	<0.0006	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0006	<0.0005	<0.0006	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0006	<0.0005	<0.0006	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		**0.0062**	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		**0.0039**	<0.0005	<0.0005	<0.0005	**0.0005**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		**0.0028**	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.270**	**0.0319**	**0.151**	**0.0332**	**0.0298**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.186**	**0.0315**	**0.148**	**0.0314**	**0.0291**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.263**	**0.0315**	**0.150**	**0.0332**	**0.0298**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**80.0**	**103**	**95.0**	**97.5**	**100**
13C8-PFOA	----	0.0002	%		**95.0**	**103**	**100**	**96.0**	**93.5**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FOT-A3-V18-0.5	FOT-A3-V18-1.0	FOT-A4-V01-0.5	FOT-A4-V02-0.5	FOT-A4-V03-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
					EB2232058-062	EB2232058-063	EB2232058-064	EB2232058-065	EB2232058-066
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**3.0**	**6.3**	**22.0**	**18.7**	**11.5**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0010	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0010	<0.0002	**0.0002**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0005**	**0.0007**	**0.0038**	**0.0060**	**0.0144**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	**0.0002**	**0.0011**	**0.0008**	**0.0013**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0185**	**0.0727**	**0.655**	**0.0196**	**0.0371**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0010**	**0.0005**	<0.0010	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.005	<0.001	**0.002**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0006**	**0.0016**	**0.0011**	<0.0002	**0.0035**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0002**	**0.0010**	<0.0010	**0.0006**	**0.0040**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0002**	**0.0013**	<0.0010	<0.0002	**0.0048**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0002**	**0.0024**	**0.0030**	**0.0003**	**0.0009**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		**0.0004**	**0.0004**	**0.0024**	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0010	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0010	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0010	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0010	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0025	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0010	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0025	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A3-V18-0.5	FOT-A3-V18-1.0	FOT-A4-V01-0.5	FOT-A4-V02-0.5	FOT-A4-V03-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-062	EB2232058-063	EB2232058-064	EB2232058-065	EB2232058-066
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0025	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0025	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0025	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0010	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0010	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	**0.0048**	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0010	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0216**	**0.0808**	**0.671**	**0.0273**	**0.0682**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0190**	**0.0734**	**0.659**	**0.0256**	**0.0515**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0202**	**0.0797**	**0.668**	**0.0265**	**0.0667**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**96.5**	**86.0**	**80.0**	**112**	**93.5**
13C8-PFOA	----	0.0002	%		**89.5**	**104**	**110**	**89.0**	**91.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FOT-A4-V04-0.5	FOT-A4-V04-1.0	FOT-A4-V05-0.5	FOT-A4-V05-1.0	FOT-A4-V06-0.5
			Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232058-067	EB2232058-068	EB2232058-069	EB2232058-070	EB2232058-071
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**23.1**	**4.3**	**26.6**	**14.3**	**22.7**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0006**	<0.0002	**0.0003**	**0.0085**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	**0.0014**	**0.0002**	<0.0002	**0.0022**	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.380**	**0.0413**	**0.191**	**0.0670**	**0.0076**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	<0.001	<0.001	**0.003**	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0005	<0.0002	**0.0020**	**0.0084**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0006**	<0.0002	**0.0018**	**0.0060**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0005	<0.0002	**0.0008**	**0.0063**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	**0.0008**	**0.0003**	**0.0059**	**0.0374**	**0.0004**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	**0.0003**	**0.0034**	**0.0018**	**0.0006**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0002	**0.0008**	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0012	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FOT-A4-V04-0.5	FOT-A4-V04-1.0	FOT-A4-V05-0.5	FOT-A4-V05-1.0	FOT-A4-V06-0.5
				Sampling date / time	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	27-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-067	EB2232058-068	EB2232058-069	EB2232058-070	EB2232058-071
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0012	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0012	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0012	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		**0.0144**	<0.0005	**0.0238**	**0.138**	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		**0.0056**	<0.0005	**0.0858**	**0.0040**	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.403**	**0.0421**	**0.316**	**0.283**	**0.0086**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.381**	**0.0413**	**0.191**	**0.0755**	**0.0076**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.402**	**0.0416**	**0.311**	**0.279**	**0.0080**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**125**	**98.5**	**89.0**	**97.0**	**98.0**
13C8-PFOA	----	0.0002	%		**105**	**92.0**	**91.0**	**100**	**93.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD09_2810	BD10_2810	FTG-A2-B4A	FTG-A2-B4B	FTG-A2-B6A
			Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232058-072	EB2232058-073	EB2232058-075	EB2232058-076	EB2232058-077
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**14.9**	**11.8**	**15.0**	**15.0**	**16.3**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0004**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0028**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0008**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.217**	**0.0065**	**0.261**	**0.0055**	**0.0134**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	**0.0008**	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	**0.0003**	<0.0002	<0.0002	**0.0003**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	**0.0003**	<0.0002	<0.0002	**0.0013**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	**0.0002**	<0.0002	<0.0002	**0.0005**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	**0.0003**	<0.0002	<0.0002	**0.0007**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	**0.0009**	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0006	<0.0005	<0.0006	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0006	<0.0005	<0.0006	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD09_2810	BD10_2810	FTG-A2-B4A	FTG-A2-B4B	FTG-A2-B6A
				Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-072	EB2232058-073	EB2232058-075	EB2232058-076	EB2232058-077
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0006	<0.0005	<0.0006	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0006	<0.0005	<0.0006	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0006	<0.0005	<0.0006	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	**0.0194**	<0.0005	**0.0010**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		**0.0006**	<0.0005	**0.0009**	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.218**	**0.0095**	**0.281**	**0.0055**	**0.0214**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.217**	**0.0065**	**0.261**	**0.0055**	**0.0162**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.218**	**0.0076**	**0.281**	**0.0055**	**0.0202**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**115**	**93.5**	**105**	**100**	**107**
13C8-PFOA	----	0.0002	%		**105**	**97.0**	**100**	**93.5**	**99.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	FTG-A2-B6C	FTG-A2-V4A-0.5	FTG-A2-V4A-1.0	FTG-A2-V4B-0.5	FTG-A2-V4B-1.0
			Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	EB2232058-078	EB2232058-079	EB2232058-080	EB2232058-081	EB2232058-082
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**13.6**	**13.8**	**13.8**	**11.1**	**9.6**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0046**	**0.0039**	**0.0033**	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	**0.0004**	<0.0002	**0.0002**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	**0.0002**	<0.0002	**0.0004**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	**0.0003**	<0.0002	**0.0003**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	**0.0004**	**0.0003**	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	**0.0006**	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A2-B6C	FTG-A2-V4A-0.5	FTG-A2-V4A-1.0	FTG-A2-V4B-0.5	FTG-A2-V4B-1.0
				Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-078	EB2232058-079	EB2232058-080	EB2232058-081	EB2232058-082
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0046**	**0.0058**	**0.0036**	**0.0012**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0046**	**0.0039**	**0.0033**	**0.0003**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0046**	**0.0052**	**0.0036**	**0.0012**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**94.0**	**105**	**108**	**98.5**	**93.0**
13C8-PFOA	----	0.0002	%		**96.5**	**96.0**	**99.0**	**98.5**	**92.5**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FTG-A2-V4C-0.5	FTG-A2-V4C-1.0	FTG-A2-V6A-0.5	FTG-A2-V6A-1.0	FTG-A2-V6B-0.5
				Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00
					EB2232058-083	EB2232058-084	EB2232058-085	EB2232058-086	EB2232058-087
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**11.8**	**11.4**	**15.2**	**13.3**	**8.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0013**	**0.0002**	**0.0005**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	**0.0007**	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0990**	**0.180**	**0.0080**	**0.0145**	**0.0100**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0005**	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0008**	<0.0002	**0.0003**	**0.0003**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		**0.0003**	**0.0004**	<0.0002	**0.0004**	**0.0005**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0006	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0006	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A2-V4C-0.5	FTG-A2-V4C-1.0	FTG-A2-V6A-0.5	FTG-A2-V6A-1.0	FTG-A2-V6B-0.5
				Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-083	EB2232058-084	EB2232058-085	EB2232058-086	EB2232058-087
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0006	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0006	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0006	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0993**	**0.183**	**0.0082**	**0.0162**	**0.0112**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0990**	**0.181**	**0.0082**	**0.0150**	**0.0100**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0990**	**0.182**	**0.0082**	**0.0153**	**0.0107**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**107**	**92.5**	**108**	**91.5**	**87.5**
13C8-PFOA	----	0.0002	%		**100**	**100**	**99.0**	**99.0**	**96.0**

Analytical Results

Sub-Matrix: **SOIL**
(Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	FTG-A2-V6B-1.0	FTG-A2-V6C-0.5	FTG-A2-V6C-1.0	FTG-A2-V7A-0.5	FTG-A2-V7A-1.0
				Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00
					EB2232058-088	EB2232058-089	EB2232058-090	EB2232058-091	EB2232058-092
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**11.3**	**9.7**	**13.6**	**12.1**	**16.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0051**	**0.0071**	**0.0065**	**0.0056**	**0.0047**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0003**	**0.0006**	**0.0004**	<0.0002	**0.0002**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0005**	**0.0004**	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0005**	**0.0003**	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	**0.0003**	**0.0003**	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0003**	**0.0003**	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		**0.0004**	**0.0007**	**0.0008**	<0.0002	**0.0003**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	**0.0004**	**0.0004**	<0.0002	**0.0002**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	**0.0003**	**0.0003**	<0.0002	**0.0002**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FTG-A2-V6B-1.0	FTG-A2-V6C-0.5	FTG-A2-V6C-1.0	FTG-A2-V7A-0.5	FTG-A2-V7A-1.0
				Sampling date / time	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00	28-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		EB2232058-088	EB2232058-089	EB2232058-090	EB2232058-091	EB2232058-092
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0058**	**0.0107**	**0.0097**	**0.0056**	**0.0056**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0051**	**0.0071**	**0.0065**	**0.0056**	**0.0047**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0051**	**0.0087**	**0.0078**	**0.0056**	**0.0047**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**91.0**	**106**	**98.5**	**108**	**90.0**
13C8-PFOA	----	0.0002	%		**96.0**	**99.5**	**103**	**96.0**	**87.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	RB_2710	RB_2810	----	----	----
			Sampling date / time	27-Oct-2022 13:00	28-Oct-2022 08:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2232058-093	EB2232058-094	--------	--------	--------
				Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L	<0.0020	<0.0020	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB_2710	RB_2810	----	----	----
				Sampling date / time	27-Oct-2022 13:00	28-Oct-2022 08:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2232058-093	EB2232058-094	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0002	<0.0002	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0002	<0.0002	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**93.7**	**105**	----	----	----
13C8-PFOA	----	0.0005	%		**95.8**	**94.2**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2232058**	Page	: 1 of 26
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 01-Nov-2022
Order number	: ----	Date Analysis Commenced	: 02-Nov-2022
C-O-C number	: ----	Issue Date	: 15-Nov-2022
Sampler	: MICHAEL KOWALCZYK		
Site	: CALLIDE		
Quote number	: BN/344/21 V3		
No. of samples received	: 94		
No. of samples analysed	: 92		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Keegan Mullane	2IC Organic Chemist	Brisbane Organics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Layla Hafner	Acid Sulphate Soils - Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4675703)									
EB2232058-001	BD01_2710	EA055: Moisture Content	----	0.1	%	11.7	11.3	3.0	0% - 20%
EB2232058-011	FOT-A1-V04-0.5	EA055: Moisture Content	----	0.1	%	4.0	4.4	11.1	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4675705)									
EB2232058-021	FOT-A1-V10-0.5	EA055: Moisture Content	----	0.1	%	11.3	11.7	3.7	0% - 20%
EB2232058-031	FOT-A3-V02-1.0	EA055: Moisture Content	----	0.1	%	10.7	10.9	2.3	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4675707)									
EB2232058-041	FOT-A3-V07-1.0	EA055: Moisture Content	----	0.1	%	3.6	3.9	8.9	0% - 20%
EB2232058-051	FOT-A3-V12-1.0	EA055: Moisture Content	----	0.1	%	5.0	4.7	7.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4675710)									
EB2232058-061	FOT-A3-V17-1.0	EA055: Moisture Content	----	0.1	%	4.7	4.9	3.7	0% - 20%
EB2232058-071	FOT-A4-V06-0.5	EA055: Moisture Content	----	0.1	%	22.7	21.5	5.2	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4675742)									
EB2232058-082	FTG-A2-V4B-1.0	EA055: Moisture Content	----	0.1	%	9.6	8.6	10.2	0% - 20%
EB2232058-092	FTG-A2-V7A-1.0	EA055: Moisture Content	----	0.1	%	16.2	14.4	11.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4675702)									
EB2232058-001	BD01_2710	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0048	0.0044	9.7	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	1.01	1.10	8.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
EB2232058-011	FOT-A1-V04-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4675702) - continued									
EB2232058-011	FOT-A1-V04-0.5	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0015	0.0009	55.2	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0147	0.0126	15.3	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0018	0.0018	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4675704)									
EB2232058-021	FOT-A1-V10-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0014	0.0027	64.8	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.341	# 0.591	53.6	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2232058-031	FOT-A3-V02-1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0018	0.0020	11.9	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4675706)									
EB2232058-041	FOT-A3-V07-1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0050	0.0048	4.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2232058-051	FOT-A3-V12-1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0125	0.0113	9.4	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4675709)									
EB2232058-061	FOT-A3-V17-1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0291	0.0320	9.5	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2232058-071	FOT-A4-V06-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4675709) - continued									
EB2232058-071	FOT-A4-V06-0.5	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0076	0.0068	10.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4675741)									
EB2232058-082	FTG-A2-V4B-1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2232058-092	FTG-A2-V7A-1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0047	0.0046	0.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4675702)									
EB2232058-001	BD01_2710	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0016	0.0027	52.7	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0138	0.0199	36.3	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0025	<0.0025	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.005	<0.005	0.0	No Limit
EB2232058-011	FOT-A1-V04-0.5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0004	0.0003	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4675704)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4675704) - continued									
EB2232058-021	FOT-A1-V10-0.5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0007	0.0007	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0041	0.0061	40.0	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.002	<0.002	0.0	No Limit
EB2232058-031	FOT-A3-V02-1.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4675706)									
EB2232058-041	FOT-A3-V07-1.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2232058-051	FOT-A3-V12-1.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4675706) - continued									
EB2232058-051	FOT-A3-V12-1.0	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4675709)									
EB2232058-061	FOT-A3-V17-1.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2232058-071	FOT-A4-V06-0.5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0004	0.0002	34.2	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0006	0.0005	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4675741)									
EB2232058-082	FTG-A2-V4B-1.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4675741) - continued									
EB2232058-092	FTG-A2-V7A-1.0	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0003	0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4675702)									
EB2232058-001	BD01_2710	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0020	0.0022	10.6	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0025	<0.0025	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0025	<0.0025	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0025	<0.0025	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0025	<0.0025	0.0	No Limit
EB2232058-011	FOT-A1-V04-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4675704)									
EB2232058-021	FOT-A1-V10-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0007	0.0014	63.1	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4675704) - continued									
EB2232058-021	FOT-A1-V10-0.5	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0012	<0.0012	0.0	No Limit
EB2232058-031	FOT-A3-V02-1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4675706)									
EB2232058-041	FOT-A3-V07-1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2232058-051	FOT-A3-V12-1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4675706) - continued									
EB2232058-051	FOT-A3-V12-1.0	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4675709)									
EB2232058-061	FOT-A3-V17-1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2232058-071	FOT-A4-V06-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4675741)									
EB2232058-082	FTG-A2-V4B-1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4675741) - continued									
EB2232058-082	FTG-A2-V4B-1.0	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2232058-092	FTG-A2-V7A-1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4675702)									
EB2232058-001	BD01_2710	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0010	<0.0010	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0010	<0.0010	0.0	No Limit
EB2232058-011	FOT-A1-V04-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4675702) - continued									
EB2232058-011	FOT-A1-V04-0.5	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4675704)									
EB2232058-021	FOT-A1-V10-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2232058-031	FOT-A3-V02-1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4675706)									
EB2232058-041	FOT-A3-V07-1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2232058-051	FOT-A3-V12-1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4675709)									
EB2232058-061	FOT-A3-V17-1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4675709) - continued									
EB2232058-061	FOT-A3-V17-1.0	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0005	0.0007	30.3	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2232058-071	FOT-A4-V06-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4675741)									
EB2232058-082	FTG-A2-V4B-1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2232058-092	FTG-A2-V7A-1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4679318)									
EB2232401-004	Anonymous	EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	0.0030	0.0027	10.7	0% - 50%
		EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0028	0.0031	9.3	No Limit
		EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4679318) - continued									
EB2232401-004	Anonymous	EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4679318)									
EB2232401-004	Anonymous	EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	0.0016	0.0016	0.0	No Limit
		EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.0005	0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0021	0.0021	0.0	No Limit
		EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	0.0047	0.0048	2.6	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4679318)									
EB2232401-004	Anonymous	EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4679318)									
EB2232401-004	Anonymous	EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	<0.001	0.0	No Limit
		EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4679318) - continued									
EB2232401-004	Anonymous	EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4679318)									
EB2232401-004	Anonymous	EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L	0.0035	0.0027	25.8	0% - 50%
		EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	0.0152	0.0148	2.7	0% - 20%
		EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	0.0152	0.0148	2.7	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675702)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	100	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	92.7	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	92.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	87.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	93.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	94.6	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675704)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	94.1	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	85.5	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	82.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	88.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	99.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	92.5	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675706)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	108	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	87.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	82.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	81.9	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	78.8	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675709)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	95.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	89.7	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	95.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	92.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	102	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	92.5	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675741)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	93.6	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	92.3	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	96.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	92.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	77.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	73.3	59.0	134

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675702)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.5	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675704)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	85.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.7	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675706)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	99.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	83.8	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675709)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	93.3	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.2	69.0	132

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675709) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.9	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675741)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	94.7	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675702)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.3	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675704)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.2	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.1	61.5	139

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675704) - continued								
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.6	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675706)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.4	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675709)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.7	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675741)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.6	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	61.9	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675741) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675702)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	96.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	115	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	92.9	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675704)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	83.8	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	110	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	77.5	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	70.0	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675706)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	93.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	97.9	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	83.8	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675709)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	99.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	92.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	102	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	96.7	54.8	124
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675741)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	98.3	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	103	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	86.7	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	67.5	54.8	124

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4679318)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	107	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	106	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	102	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	110	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	85.8	65.0	140

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4679318) - continued								
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	86.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4679318)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	106	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	103	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	104	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	98.4	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	106	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	98.8	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	104	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	115	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	110	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	82.0	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4679318)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	104	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	109	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	111	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	104	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	111	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	115	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	110	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4679318)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	112	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	116	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	99.6	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	94.9	53.1	133
EP231P: PFAS Sums (QCLot: 4679318)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675702)							
EB2232058-002	BD02_2710	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	95.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	90.6	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	86.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	96.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	94.5	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675704)							
EB2232058-022	FOT-A1-V11-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	85.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	77.4	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	# Not Determined	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	88.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	# Not Determined	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675706)							
EB2232058-042	FOT-A3-V08-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	109	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	87.6	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	96.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	86.1	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	75.7	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	83.8	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675709)							
EB2232058-062	FOT-A3-V18-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	93.6	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	85.9	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	112	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	97.9	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	113	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675741)							
EB2232058-083	FTG-A2-V4C-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	98.2	72.0	128

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4675741) - continued							
EB2232058-083	FTG-A2-V4C-0.5	EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	104	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	116	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	101	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675702)							
EB2232058-002	BD02_2710	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.1	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	88.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	94.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	92.8	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	88.4	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	98.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	100	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	105	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	101	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	86.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	93.9	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675704)							
EB2232058-022	FOT-A1-V11-0.5	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	88.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	83.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	77.6	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	84.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	81.6	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	87.6	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	99.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	91.6	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	96.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	85.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	90.9	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675706)							
EB2232058-042	FOT-A3-V08-0.5	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	99.5	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	84.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	100	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	103	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	97.6	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	78.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	93.2	69.0	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675706) - continued							
EB2232058-042	FOT-A3-V08-0.5	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	103	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	89.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	93.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	88.3	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675709)							
EB2232058-062	FOT-A3-V18-0.5	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	101	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	82.9	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	119	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	98.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	87.6	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	90.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	90.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	94.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	82.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	84.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	98.7	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4675741)							
EB2232058-083	FTG-A2-V4C-0.5	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	101	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	78.4	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	106	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	90.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	87.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	85.6	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	90.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	109	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	94.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	113	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	104	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675702)							
EB2232058-002	BD02_2710	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	89.6	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	108	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	96.4	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675702) - continued							
EB2232058-002	BD02_2710	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	102	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675704)							
EB2232058-022	FOT-A1-V11-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	92.0	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	99.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	100.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	93.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	91.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	97.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	87.2	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675706)							
EB2232058-042	FOT-A3-V08-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	90.0	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	104	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	104	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	106	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	92.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	94.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675709)							
EB2232058-062	FOT-A3-V18-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	84.4	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	87.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	95.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	100.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	91.6	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675709) - continued							
EB2232058-062	FOT-A3-V18-0.5	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	82.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4675741)							
EB2232058-083	FTG-A2-V4C-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	87.2	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	112	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	112	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	115	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	78.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675702)							
EB2232058-002	BD02_2710	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	102	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	96.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	94.6	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	100	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675704)							
EB2232058-022	FOT-A1-V11-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	85.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	97.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	83.3	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	84.6	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675706)							
EB2232058-042	FOT-A3-V08-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	92.7	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	84.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	105	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	82.5	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675709)							
EB2232058-062	FOT-A3-V18-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	101	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	96.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	101	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	102	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675741)							
EB2232058-083	FTG-A2-V4C-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	102	62.0	145

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4675741) - continued							
EB2232058-083	FTG-A2-V4C-0.5	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	129	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	90.0	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	75.0	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2232058**	Page	: 1 of 16
Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Telephone	: +61-7-3243 7222
Project	: BCL220033.01 CALLIDE	Date Samples Received	: 01-Nov-2022
Site	: CALLIDE	Issue Date	: 15-Nov-2022
Sampler	: MICHAEL KOWALCZYK	No. of samples received	: 94
Order number	: ----	No. of samples analysed	: 92

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2232058--021	FOT-A1-V10-0.5	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	53.6 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2232058--002	BD02_2710	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2232058--022	FOT-A1-V11-0.5	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2232058--062	FOT-A3-V18-0.5	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2232058--083	FTG-A2-V4C-0.5	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EB2232058--022	FOT-A1-V11-0.5	**Perfluorodecane sulfonic acid (PFDS)**	335-77-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	13	7.69	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	13	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	Due for extraction	Evaluation	***Date analysed***	Due for analysis	Evaluation

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
BD01_2710, BD02_2710, BD03_2710, BD04_2710, BD05_2710, BD06_2710, BD07_2710, BD08_2710, FOT-A1-V03-0.5, FOT-A1-V03-1.0, FOT-A1-V04-0.5, FOT-A1-V04-1.0, FOT-A1-V05-0.5, FOT-A1-V05-1.0, FOT-A1-V06-0.5, FOT-A1-V06-1.0, FOT-A1-V07-0.5, FOT-A1-V07-1.0, FOT-A1-V08-0.5, FOT-A1-V09-0.5, FOT-A1-V10-0.5, FOT-A1-V11-0.5, FOT-A1-V11-1.0, FOT-A1-V12-0.5, FOT-A1-V12-1.0, FOT-A1-V13-0.5, FOT-A3-V01-0.5, FOT-A3-V01-1.0, FOT-A3-V02-0.5, FOT-A3-V02-1.0, FOT-A3-V03-0.5, FOT-A3-V03-1.0, FOT-A3-V04-0.5, FOT-A3-V04-1.0, FOT-A3-V05-0.5, FOT-A3-V05-1.0, FOT-A3-V06-0.5, FOT-A3-V06-1.0, FOT-A3-V07-0.5, FOT-A3-V07-1.0, FOT-A3-V08-0.5, FOT-A3-V08-1.0, FOT-A3-V09-0.5, FOT-A3-V09-1.0, FOT-A3-V10-0.5, FOT-A3-V10-1.0, FOT-A3-V11-0.5, FOT-A3-V11-1.0, FOT-A3-V12-0.5, FOT-A3-V12-1.0, FOT-A3-V13-0.5, FOT-A3-V13-1.0, FOT-A3-V14-0.5, FOT-A3-V14-1.0, FOT-A3-V15-0.5, FOT-A3-V15-1.0, FOT-A3-V16-0.5, FOT-A3-V16-1.0, FOT-A3-V17-0.5, FOT-A3-V17-1.0, FOT-A3-V18-0.5, FOT-A3-V18-1.0, FOT-A4-V01-0.5, FOT-A4-V02-0.5, FOT-A4-V03-0.5, FOT-A4-V04-0.5, FOT-A4-V04-1.0, FOT-A4-V05-0.5, FOT-A4-V05-1.0	**27-Oct-2022**	**----**	----	----	**02-Nov-2022**	10-Nov-2022	✓
HDPE Soil Jar (EA055)							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C) - Continued							
FOT-A4-V06-0.5, BD09_2810, BD10_2810, FTG-A2-B4A, FTG-A2-B4B, FTG-A2-B6A, FTG-A2-B6C, FTG-A2-V4A-0.5, FTG-A2-V4A-1.0, FTG-A2-V4B-0.5, FTG-A2-V4B-1.0, FTG-A2-V4C-0.5, FTG-A2-V4C-1.0, FTG-A2-V6A-0.5, FTG-A2-V6A-1.0, FTG-A2-V6B-0.5, FTG-A2-V6B-1.0, FTG-A2-V6C-0.5, FTG-A2-V6C-1.0, FTG-A2-V7A-0.5, FTG-A2-V7A-1.0	**28-Oct-2022**	**----**	----	----	**02-Nov-2022**	11-Nov-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
BD01_2710, BD02_2710, BD03_2710, BD04_2710, BD05_2710, BD06_2710, BD07_2710, BD08_2710, FOT-A1-V03-0.5, FOT-A1-V03-1.0, FOT-A1-V04-0.5, FOT-A1-V04-1.0, FOT-A1-V05-0.5, FOT-A1-V05-1.0, FOT-A1-V06-0.5, FOT-A1-V06-1.0, FOT-A1-V07-0.5, FOT-A1-V07-1.0, FOT-A1-V08-0.5, FOT-A1-V09-0.5, FOT-A1-V10-0.5, FOT-A1-V11-0.5, FOT-A1-V11-1.0, FOT-A1-V12-0.5, FOT-A1-V12-1.0, FOT-A1-V13-0.5, FOT-A3-V01-0.5, FOT-A3-V01-1.0, FOT-A3-V02-0.5, FOT-A3-V02-1.0, FOT-A3-V03-0.5, FOT-A3-V03-1.0, FOT-A3-V04-0.5, FOT-A3-V04-1.0, FOT-A3-V05-0.5, FOT-A3-V05-1.0, FOT-A3-V06-0.5, FOT-A3-V06-1.0, FOT-A3-V07-0.5, FOT-A3-V07-1.0, FOT-A3-V08-0.5, FOT-A3-V08-1.0, FOT-A3-V09-0.5, FOT-A3-V09-1.0, FOT-A3-V10-0.5, FOT-A3-V10-1.0, FOT-A3-V11-0.5, FOT-A3-V11-1.0, FOT-A3-V12-0.5, FOT-A3-V12-1.0, FOT-A3-V13-0.5, FOT-A3-V13-1.0, FOT-A3-V14-0.5, FOT-A3-V14-1.0, FOT-A3-V15-0.5, FOT-A3-V15-1.0, FOT-A3-V16-0.5, FOT-A3-V16-1.0, FOT-A3-V17-0.5	**27-Oct-2022**	**03-Nov-2022**	25-Apr-2023	✓	**10-Nov-2022**	13-Dec-2022	✓
HDPE Soil Jar (EP231X)							
FOT-A3-V17-1.0, FOT-A3-V18-0.5, FOT-A3-V18-1.0, FOT-A4-V01-0.5, FOT-A4-V02-0.5, FOT-A4-V03-0.5, FOT-A4-V04-0.5, FOT-A4-V04-1.0, FOT-A4-V05-0.5, FOT-A4-V05-1.0	**27-Oct-2022**	**04-Nov-2022**	25-Apr-2023	✓	**10-Nov-2022**	14-Dec-2022	✓
HDPE Soil Jar (EP231X)							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids - Continued							
FOT-A4-V06-0.5, BD09_2810, BD10_2810, FTG-A2-B4A, FTG-A2-B4B, FTG-A2-B6A, FTG-A2-B6C, FTG-A2-V4A-0.5, FTG-A2-V4A-1.0, FTG-A2-V4B-0.5, FTG-A2-V4B-1.0, FTG-A2-V4C-0.5, FTG-A2-V4C-1.0, FTG-A2-V6A-0.5, FTG-A2-V6A-1.0, FTG-A2-V6B-0.5, FTG-A2-V6B-1.0, FTG-A2-V6C-0.5, FTG-A2-V6C-1.0, FTG-A2-V7A-0.5, FTG-A2-V7A-1.0	**28-Oct-2022**	**04-Nov-2022**	26-Apr-2023	✓	**10-Nov-2022**	14-Dec-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
BD01_2710, BD02_2710, BD03_2710, BD04_2710, BD05_2710, BD06_2710, BD07_2710, BD08_2710, FOT-A1-V03-0.5, FOT-A1-V03-1.0, FOT-A1-V04-0.5, FOT-A1-V04-1.0, FOT-A1-V05-0.5, FOT-A1-V05-1.0, FOT-A1-V06-0.5, FOT-A1-V06-1.0, FOT-A1-V07-0.5, FOT-A1-V07-1.0, FOT-A1-V08-0.5, FOT-A1-V09-0.5, FOT-A1-V10-0.5, FOT-A1-V11-0.5, FOT-A1-V11-1.0, FOT-A1-V12-0.5, FOT-A1-V12-1.0, FOT-A1-V13-0.5, FOT-A3-V01-0.5, FOT-A3-V01-1.0, FOT-A3-V02-0.5, FOT-A3-V02-1.0, FOT-A3-V03-0.5, FOT-A3-V03-1.0, FOT-A3-V04-0.5, FOT-A3-V04-1.0, FOT-A3-V05-0.5, FOT-A3-V05-1.0, FOT-A3-V06-0.5, FOT-A3-V06-1.0, FOT-A3-V07-0.5, FOT-A3-V07-1.0, FOT-A3-V08-0.5, FOT-A3-V08-1.0, FOT-A3-V09-0.5, FOT-A3-V09-1.0, FOT-A3-V10-0.5, FOT-A3-V10-1.0, FOT-A3-V11-0.5, FOT-A3-V11-1.0, FOT-A3-V12-0.5, FOT-A3-V12-1.0, FOT-A3-V13-0.5, FOT-A3-V13-1.0, FOT-A3-V14-0.5, FOT-A3-V14-1.0, FOT-A3-V15-0.5, FOT-A3-V15-1.0, FOT-A3-V16-0.5, FOT-A3-V16-1.0, FOT-A3-V17-0.5	**27-Oct-2022**	**03-Nov-2022**	25-Apr-2023	✓	**10-Nov-2022**	13-Dec-2022	✓
HDPE Soil Jar (EP231X)							
FOT-A3-V17-1.0, FOT-A3-V18-0.5, FOT-A3-V18-1.0, FOT-A4-V01-0.5, FOT-A4-V02-0.5, FOT-A4-V03-0.5, FOT-A4-V04-0.5, FOT-A4-V04-1.0, FOT-A4-V05-0.5, FOT-A4-V05-1.0	**27-Oct-2022**	**04-Nov-2022**	25-Apr-2023	✓	**10-Nov-2022**	14-Dec-2022	✓
HDPE Soil Jar (EP231X)							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids - Continued							
FOT-A4-V06-0.5, BD09_2810, BD10_2810, FTG-A2-B4A, FTG-A2-B4B, FTG-A2-B6A, FTG-A2-B6C, FTG-A2-V4A-0.5, FTG-A2-V4A-1.0, FTG-A2-V4B-0.5, FTG-A2-V4B-1.0, FTG-A2-V4C-0.5, FTG-A2-V4C-1.0, FTG-A2-V6A-0.5, FTG-A2-V6A-1.0, FTG-A2-V6B-0.5, FTG-A2-V6B-1.0, FTG-A2-V6C-0.5, FTG-A2-V6C-1.0, FTG-A2-V7A-0.5, FTG-A2-V7A-1.0	**28-Oct-2022**	**04-Nov-2022**	26-Apr-2023	✓	**10-Nov-2022**	14-Dec-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
BD01_2710, BD02_2710, BD03_2710, BD04_2710, BD05_2710, BD06_2710, BD07_2710, BD08_2710, FOT-A1-V03-0.5, FOT-A1-V03-1.0, FOT-A1-V04-0.5, FOT-A1-V04-1.0, FOT-A1-V05-0.5, FOT-A1-V05-1.0, FOT-A1-V06-0.5, FOT-A1-V06-1.0, FOT-A1-V07-0.5, FOT-A1-V07-1.0, FOT-A1-V08-0.5, FOT-A1-V09-0.5, FOT-A1-V10-0.5, FOT-A1-V11-0.5, FOT-A1-V11-1.0, FOT-A1-V12-0.5, FOT-A1-V12-1.0, FOT-A1-V13-0.5, FOT-A3-V01-0.5, FOT-A3-V01-1.0, FOT-A3-V02-0.5, FOT-A3-V02-1.0, FOT-A3-V03-0.5, FOT-A3-V03-1.0, FOT-A3-V04-0.5, FOT-A3-V04-1.0, FOT-A3-V05-0.5, FOT-A3-V05-1.0, FOT-A3-V06-0.5, FOT-A3-V06-1.0, FOT-A3-V07-0.5, FOT-A3-V07-1.0, FOT-A3-V08-0.5, FOT-A3-V08-1.0, FOT-A3-V09-0.5, FOT-A3-V09-1.0, FOT-A3-V10-0.5, FOT-A3-V10-1.0, FOT-A3-V11-0.5, FOT-A3-V11-1.0, FOT-A3-V12-0.5, FOT-A3-V12-1.0, FOT-A3-V13-0.5, FOT-A3-V13-1.0, FOT-A3-V14-0.5, FOT-A3-V14-1.0, FOT-A3-V15-0.5, FOT-A3-V15-1.0, FOT-A3-V16-0.5, FOT-A3-V16-1.0, FOT-A3-V17-0.5	**27-Oct-2022**	**03-Nov-2022**	25-Apr-2023	✓	**10-Nov-2022**	13-Dec-2022	✓
HDPE Soil Jar (EP231X)							
FOT-A3-V17-1.0, FOT-A3-V18-0.5, FOT-A3-V18-1.0, FOT-A4-V01-0.5, FOT-A4-V02-0.5, FOT-A4-V03-0.5, FOT-A4-V04-0.5, FOT-A4-V04-1.0, FOT-A4-V05-0.5, FOT-A4-V05-1.0	**27-Oct-2022**	**04-Nov-2022**	25-Apr-2023	✓	**10-Nov-2022**	14-Dec-2022	✓
HDPE Soil Jar (EP231X)							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides - Continued							
FOT-A4-V06-0.5, BD09_2810, BD10_2810, FTG-A2-B4A, FTG-A2-B4B, FTG-A2-B6A, FTG-A2-B6C, FTG-A2-V4A-0.5, FTG-A2-V4A-1.0, FTG-A2-V4B-0.5, FTG-A2-V4B-1.0, FTG-A2-V4C-0.5, FTG-A2-V4C-1.0, FTG-A2-V6A-0.5, FTG-A2-V6A-1.0, FTG-A2-V6B-0.5, FTG-A2-V6B-1.0, FTG-A2-V6C-0.5, FTG-A2-V6C-1.0, FTG-A2-V7A-0.5, FTG-A2-V7A-1.0	**28-Oct-2022**	**04-Nov-2022**	26-Apr-2023	✓	**10-Nov-2022**	14-Dec-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
BD01_2710, BD02_2710, BD03_2710, BD04_2710, BD05_2710, BD06_2710, BD07_2710, BD08_2710, FOT-A1-V03-0.5, FOT-A1-V03-1.0, FOT-A1-V04-0.5, FOT-A1-V04-1.0, FOT-A1-V05-0.5, FOT-A1-V05-1.0, FOT-A1-V06-0.5, FOT-A1-V06-1.0, FOT-A1-V07-0.5, FOT-A1-V07-1.0, FOT-A1-V08-0.5, FOT-A1-V09-0.5, FOT-A1-V10-0.5, FOT-A1-V11-0.5, FOT-A1-V11-1.0, FOT-A1-V12-0.5, FOT-A1-V12-1.0, FOT-A1-V13-0.5, FOT-A3-V01-0.5, FOT-A3-V01-1.0, FOT-A3-V02-0.5, FOT-A3-V02-1.0, FOT-A3-V03-0.5, FOT-A3-V03-1.0, FOT-A3-V04-0.5, FOT-A3-V04-1.0, FOT-A3-V05-0.5, FOT-A3-V05-1.0, FOT-A3-V06-0.5, FOT-A3-V06-1.0, FOT-A3-V07-0.5, FOT-A3-V07-1.0, FOT-A3-V08-0.5, FOT-A3-V08-1.0, FOT-A3-V09-0.5, FOT-A3-V09-1.0, FOT-A3-V10-0.5, FOT-A3-V10-1.0, FOT-A3-V11-0.5, FOT-A3-V11-1.0, FOT-A3-V12-0.5, FOT-A3-V12-1.0, FOT-A3-V13-0.5, FOT-A3-V13-1.0, FOT-A3-V14-0.5, FOT-A3-V14-1.0, FOT-A3-V15-0.5, FOT-A3-V15-1.0, FOT-A3-V16-0.5, FOT-A3-V16-1.0, FOT-A3-V17-0.5	**27-Oct-2022**	**03-Nov-2022**	25-Apr-2023	✓	**10-Nov-2022**	13-Dec-2022	✓
HDPE Soil Jar (EP231X)							
FOT-A3-V17-1.0, FOT-A3-V18-0.5, FOT-A3-V18-1.0, FOT-A4-V01-0.5, FOT-A4-V02-0.5, FOT-A4-V03-0.5, FOT-A4-V04-0.5, FOT-A4-V04-1.0, FOT-A4-V05-0.5, FOT-A4-V05-1.0	**27-Oct-2022**	**04-Nov-2022**	25-Apr-2023	✓	**10-Nov-2022**	14-Dec-2022	✓
HDPE Soil Jar (EP231X)							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued							
FOT-A4-V06-0.5, BD09_2810, BD10_2810, FTG-A2-B4A, FTG-A2-B4B, FTG-A2-B6A, FTG-A2-B6C, FTG-A2-V4A-0.5, FTG-A2-V4A-1.0, FTG-A2-V4B-0.5, FTG-A2-V4B-1.0, FTG-A2-V4C-0.5, FTG-A2-V4C-1.0, FTG-A2-V6A-0.5, FTG-A2-V6A-1.0, FTG-A2-V6B-0.5, FTG-A2-V6B-1.0, FTG-A2-V6C-0.5, FTG-A2-V6C-1.0, FTG-A2-V7A-0.5, FTG-A2-V7A-1.0	**28-Oct-2022**	**04-Nov-2022**	26-Apr-2023	✓	**10-Nov-2022**	14-Dec-2022	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
BD01_2710, BD02_2710, BD03_2710, BD04_2710, BD05_2710, BD06_2710, BD07_2710, BD08_2710, FOT-A1-V03-0.5, FOT-A1-V03-1.0, FOT-A1-V04-0.5, FOT-A1-V04-1.0, FOT-A1-V05-0.5, FOT-A1-V05-1.0, FOT-A1-V06-0.5, FOT-A1-V06-1.0, FOT-A1-V07-0.5, FOT-A1-V07-1.0, FOT-A1-V08-0.5, FOT-A1-V09-0.5, FOT-A1-V10-0.5, FOT-A1-V11-0.5, FOT-A1-V11-1.0, FOT-A1-V12-0.5, FOT-A1-V12-1.0, FOT-A1-V13-0.5, FOT-A3-V01-0.5, FOT-A3-V01-1.0, FOT-A3-V02-0.5, FOT-A3-V02-1.0, FOT-A3-V03-0.5, FOT-A3-V03-1.0, FOT-A3-V04-0.5, FOT-A3-V04-1.0, FOT-A3-V05-0.5, FOT-A3-V05-1.0, FOT-A3-V06-0.5, FOT-A3-V06-1.0, FOT-A3-V07-0.5, FOT-A3-V07-1.0, FOT-A3-V08-0.5, FOT-A3-V08-1.0, FOT-A3-V09-0.5, FOT-A3-V09-1.0, FOT-A3-V10-0.5, FOT-A3-V10-1.0, FOT-A3-V11-0.5, FOT-A3-V11-1.0, FOT-A3-V12-0.5, FOT-A3-V12-1.0, FOT-A3-V13-0.5, FOT-A3-V13-1.0, FOT-A3-V14-0.5, FOT-A3-V14-1.0, FOT-A3-V15-0.5, FOT-A3-V15-1.0, FOT-A3-V16-0.5, FOT-A3-V16-1.0, FOT-A3-V17-0.5	**27-Oct-2022**	**03-Nov-2022**	25-Apr-2023	✓	**10-Nov-2022**	13-Dec-2022	✓
HDPE Soil Jar (EP231X)							
FOT-A3-V17-1.0, FOT-A3-V18-0.5, FOT-A3-V18-1.0, FOT-A4-V01-0.5, FOT-A4-V02-0.5, FOT-A4-V03-0.5, FOT-A4-V04-0.5, FOT-A4-V04-1.0, FOT-A4-V05-0.5, FOT-A4-V05-1.0	**27-Oct-2022**	**04-Nov-2022**	25-Apr-2023	✓	**10-Nov-2022**	14-Dec-2022	✓
HDPE Soil Jar (EP231X)							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums - Continued							
FOT-A4-V06-0.5, BD09_2810, BD10_2810, FTG-A2-B4A, FTG-A2-B4B, FTG-A2-B6A, FTG-A2-B6C, FTG-A2-V4A-0.5, FTG-A2-V4A-1.0, FTG-A2-V4B-0.5, FTG-A2-V4B-1.0, FTG-A2-V4C-0.5, FTG-A2-V4C-1.0, FTG-A2-V6A-0.5, FTG-A2-V6A-1.0, FTG-A2-V6B-0.5, FTG-A2-V6B-1.0, FTG-A2-V6C-0.5, FTG-A2-V6C-1.0, FTG-A2-V7A-0.5, FTG-A2-V7A-1.0	**28-Oct-2022**	**04-Nov-2022**	26-Apr-2023	✓	**10-Nov-2022**	14-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) RB_2710	**27-Oct-2022**	**09-Nov-2022**	25-Apr-2023	✓	**09-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB_2810	**28-Oct-2022**	**09-Nov-2022**	26-Apr-2023	✓	**09-Nov-2022**	26-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT) RB_2710	**27-Oct-2022**	**09-Nov-2022**	25-Apr-2023	✓	**09-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB_2810	**28-Oct-2022**	**09-Nov-2022**	26-Apr-2023	✓	**09-Nov-2022**	26-Apr-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) RB_2710	**27-Oct-2022**	**09-Nov-2022**	25-Apr-2023	✓	**09-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB_2810	**28-Oct-2022**	**09-Nov-2022**	26-Apr-2023	✓	**09-Nov-2022**	26-Apr-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT) RB_2710	**27-Oct-2022**	**09-Nov-2022**	25-Apr-2023	✓	**09-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB_2810	**28-Oct-2022**	**09-Nov-2022**	26-Apr-2023	✓	**09-Nov-2022**	26-Apr-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) RB_2710	**27-Oct-2022**	**09-Nov-2022**	25-Apr-2023	✓	**09-Nov-2022**	25-Apr-2023	✓
HDPE (no PTFE) (EP231X-SUT) RB_2810	**28-Oct-2022**	**09-Nov-2022**	26-Apr-2023	✓	**09-Nov-2022**	26-Apr-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	10	94	**10.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	10	99	**10.10**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	99	**5.05**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	99	**5.05**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	99	**5.05**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	13	**7.69**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	0	13	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2232058**

Client	: **EPIC ENVIRONMENTAL**	Laboratory	: Environmental Division Brisbane
Contact	: LUKE AMIES	Contact	: Kimberly Hilton-Barber
Address	: LEVEL 17 95 NORTH QUAY BRISBANE QLD, AUSTRALIA 4000	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: lamies@epicenvironmental.com.au	E-mail	: k.hiltonbarber@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: BCL220033.01 CALLIDE	Page	: 1 of 5
Order number	: ----	Quote number	: ES2021EPIENV0002 (BN/344/21 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: CALLIDE		
Sampler	: MICHAEL KOWALCZYK		

Dates

Date Samples Received	: 01-Nov-2022 09:45	Issue Date	: 01-Nov-2022
Client Requested Due Date	: 14-Nov-2022	Scheduled Reporting Date	: **14-Nov-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 0.9°C<->5.9°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 94 / 93

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- ***Samples were originally received by ALS Gladstone (9°C), and have been forwarded to ALS Brisbane for analysis.**
- ***1/11/2022*: SRN has been resent to acknowledge addition of comments regarding samples sent to Eurofins analyiss . For any further information regarding these adjustments please contact client services at ALSEnviro.Brisbane@alsglobal.com.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **Samples with prefix "SD" have been forwarded to Eurofins, as requested. Please note that this will incur a freight forwarding fee.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2232058-001	27-Oct-2022 00:00	BD01_2710		✓	✓
EB2232058-002	27-Oct-2022 00:00	BD02_2710		✓	✓
EB2232058-003	27-Oct-2022 00:00	BD03_2710		✓	✓
EB2232058-004	27-Oct-2022 00:00	BD04_2710		✓	✓
EB2232058-005	27-Oct-2022 00:00	BD05_2710		✓	✓
EB2232058-006	27-Oct-2022 00:00	BD06_2710		✓	✓
EB2232058-007	27-Oct-2022 00:00	BD07_2710		✓	✓
EB2232058-008	27-Oct-2022 00:00	BD08_2710		✓	✓
EB2232058-009	27-Oct-2022 00:00	FOT-A1-V03-0.5		✓	✓
EB2232058-010	27-Oct-2022 00:00	FOT-A1-V03-1.0		✓	✓
EB2232058-011	27-Oct-2022 00:00	FOT-A1-V04-0.5		✓	✓
EB2232058-012	27-Oct-2022 00:00	FOT-A1-V04-1.0		✓	✓
EB2232058-013	27-Oct-2022 00:00	FOT-A1-V05-0.5		✓	✓
EB2232058-014	27-Oct-2022 00:00	FOT-A1-V05-1.0		✓	✓
EB2232058-015	27-Oct-2022 00:00	FOT-A1-V06-0.5		✓	✓
EB2232058-016	27-Oct-2022 00:00	FOT-A1-V06-1.0		✓	✓
EB2232058-017	27-Oct-2022 00:00	FOT-A1-V07-0.5		✓	✓
EB2232058-018	27-Oct-2022 00:00	FOT-A1-V07-1.0		✓	✓
EB2232058-019	27-Oct-2022 00:00	FOT-A1-V08-0.5		✓	✓
EB2232058-020	27-Oct-2022 00:00	FOT-A1-V09-0.5		✓	✓
EB2232058-021	27-Oct-2022 00:00	FOT-A1-V10-0.5		✓	✓
EB2232058-022	27-Oct-2022 00:00	FOT-A1-V11-0.5		✓	✓
EB2232058-023	27-Oct-2022 00:00	FOT-A1-V11-1.0		✓	✓
EB2232058-024	27-Oct-2022 00:00	FOT-A1-V12-0.5		✓	✓
EB2232058-025	27-Oct-2022 00:00	FOT-A1-V12-1.0		✓	✓
EB2232058-026	27-Oct-2022 00:00	FOT-A1-V13-0.5		✓	✓
EB2232058-027	27-Oct-2022 00:00	FOT-A1-V13-1.0		✓	✓
EB2232058-028	27-Oct-2022 00:00	FOT-A3-V01-0.5		✓	✓
EB2232058-029	27-Oct-2022 00:00	FOT-A3-V01-1.0		✓	✓
EB2232058-030	27-Oct-2022 00:00	FOT-A3-V02-0.5		✓	✓
EB2232058-031	27-Oct-2022 00:00	FOT-A3-V02-1.0		✓	✓
EB2232058-032	27-Oct-2022 00:00	FOT-A3-V03-0.5		✓	✓
EB2232058-033	27-Oct-2022 00:00	FOT-A3-V03-1.0		✓	✓
EB2232058-034	27-Oct-2022 00:00	FOT-A3-V04-0.5		✓	✓
EB2232058-035	27-Oct-2022 00:00	FOT-A3-V04-1.0		✓	✓

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2232058-036	27-Oct-2022 00:00	FOT-A3-V05-0.5		✓	✓
EB2232058-037	27-Oct-2022 00:00	FOT-A3-V05-1.0		✓	✓
EB2232058-038	27-Oct-2022 00:00	FOT-A3-V06-0.5		✓	✓
EB2232058-039	27-Oct-2022 00:00	FOT-A3-V06-1.0		✓	✓
EB2232058-040	27-Oct-2022 00:00	FOT-A3-V07-0.5		✓	✓
EB2232058-041	27-Oct-2022 00:00	FOT-A3-V07-1.0		✓	✓
EB2232058-042	27-Oct-2022 00:00	FOT-A3-V08-0.5		✓	✓
EB2232058-043	27-Oct-2022 00:00	FOT-A3-V08-1.0		✓	✓
EB2232058-044	27-Oct-2022 00:00	FOT-A3-V09-0.5		✓	✓
EB2232058-045	27-Oct-2022 00:00	FOT-A3-V09-1.0		✓	✓
EB2232058-046	27-Oct-2022 00:00	FOT-A3-V10-0.5		✓	✓
EB2232058-047	27-Oct-2022 00:00	FOT-A3-V10-1.0		✓	✓
EB2232058-048	27-Oct-2022 00:00	FOT-A3-V11-0.5		✓	✓
EB2232058-049	27-Oct-2022 00:00	FOT-A3-V11-1.0		✓	✓
EB2232058-050	27-Oct-2022 00:00	FOT-A3-V12-0.5		✓	✓
EB2232058-051	27-Oct-2022 00:00	FOT-A3-V12-1.0		✓	✓
EB2232058-052	27-Oct-2022 00:00	FOT-A3-V13-0.5		✓	✓
EB2232058-053	27-Oct-2022 00:00	FOT-A3-V13-1.0		✓	✓
EB2232058-054	27-Oct-2022 00:00	FOT-A3-V14-0.5		✓	✓
EB2232058-055	27-Oct-2022 00:00	FOT-A3-V14-1.0		✓	✓
EB2232058-056	27-Oct-2022 00:00	FOT-A3-V15-0.5		✓	✓
EB2232058-057	27-Oct-2022 00:00	FOT-A3-V15-1.0		✓	✓
EB2232058-058	27-Oct-2022 00:00	FOT-A3-V16-0.5		✓	✓
EB2232058-059	27-Oct-2022 00:00	FOT-A3-V16-1.0		✓	✓
EB2232058-060	27-Oct-2022 00:00	FOT-A3-V17-0.5		✓	✓
EB2232058-061	27-Oct-2022 00:00	FOT-A3-V17-1.0		✓	✓
EB2232058-062	27-Oct-2022 00:00	FOT-A3-V18-0.5		✓	✓
EB2232058-063	27-Oct-2022 00:00	FOT-A3-V18-1.0		✓	✓
EB2232058-064	27-Oct-2022 00:00	FOT-A4-V01-0.5		✓	✓
EB2232058-065	27-Oct-2022 00:00	FOT-A4-V02-0.5		✓	✓
EB2232058-066	27-Oct-2022 00:00	FOT-A4-V03-0.5		✓	✓
EB2232058-067	27-Oct-2022 00:00	FOT-A4-V04-0.5		✓	✓
EB2232058-068	27-Oct-2022 00:00	FOT-A4-V04-1.0		✓	✓
EB2232058-069	27-Oct-2022 00:00	FOT-A4-V05-0.5		✓	✓
EB2232058-070	27-Oct-2022 00:00	FOT-A4-V05-1.0		✓	✓
EB2232058-071	28-Oct-2022 00:00	FOT-A4-V06-0.5		✓	✓
EB2232058-072	28-Oct-2022 00:00	BD09_2810		✓	✓
EB2232058-073	28-Oct-2022 00:00	BD10_2810		✓	✓
EB2232058-074	28-Oct-2022 00:00	BD11_2810	✓		
EB2232058-075	28-Oct-2022 00:00	FTG-A2-B4A		✓	✓
EB2232058-076	28-Oct-2022 00:00	FTG-A2-B4B		✓	✓

			(On Hold) SOIL No analysis requested	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2232058-077	28-Oct-2022 00:00	FTG-A2-B6A		✓	✓
EB2232058-078	28-Oct-2022 00:00	FTG-A2-B6C		✓	✓
EB2232058-079	28-Oct-2022 00:00	FTG-A2-V4A-0.5		✓	✓
EB2232058-080	28-Oct-2022 00:00	FTG-A2-V4A-1.0		✓	✓
EB2232058-081	28-Oct-2022 00:00	FTG-A2-V4B-0.5		✓	✓
EB2232058-082	28-Oct-2022 00:00	FTG-A2-V4B-1.0		✓	✓
EB2232058-083	28-Oct-2022 00:00	FTG-A2-V4C-0.5		✓	✓
EB2232058-084	28-Oct-2022 00:00	FTG-A2-V4C-1.0		✓	✓
EB2232058-085	28-Oct-2022 00:00	FTG-A2-V6A-0.5		✓	✓
EB2232058-086	28-Oct-2022 00:00	FTG-A2-V6A-1.0		✓	✓
EB2232058-087	28-Oct-2022 00:00	FTG-A2-V6B-0.5		✓	✓
EB2232058-088	28-Oct-2022 00:00	FTG-A2-V6B-1.0		✓	✓
EB2232058-089	28-Oct-2022 00:00	FTG-A2-V6C-0.5		✓	✓
EB2232058-090	28-Oct-2022 00:00	FTG-A2-V6C-1.0		✓	✓
EB2232058-091	28-Oct-2022 00:00	FTG-A2-V7A-0.5		✓	✓
EB2232058-092	28-Oct-2022 00:00	FTG-A2-V7A-1.0		✓	✓

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29
EB2232058-093	27-Oct-2022 13:00	RB_2710	✓
EB2232058-094	28-Oct-2022 08:00	RB_2810	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ESDAT REPORTS		
- EDI Format - ESDAT (ESDAT)	Email	epicenvironmental@esdat.com.au
INVOICES		
- A4 - AU Tax Invoice (INV)	Email	accounts@epicenvironmental.com.au
INVOICES & RESULTS		
- *AU Certificate of Analysis - NATA (COA)	Email	labs@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	labs@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	labs@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	labs@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	labs@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	labs@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	labs@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	labs@epicenvironmental.com.au
LUKE AMIES		
- *AU Certificate of Analysis - NATA (COA)	Email	lamies@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	lamies@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	lamies@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	lamies@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	lamies@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	lamies@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	lamies@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	lamies@epicenvironmental.com.au
MICHAEL KOWALCZYK		
- *AU Certificate of Analysis - NATA (COA)	Email	mkowalczyk@epicenvironmental.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mkowalczyk@epicenvironmental.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mkowalczyk@epicenvironmental.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mkowalczyk@epicenvironmental.com.au
- Chain of Custody (CoC) (COC)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ENVNC_V4 (ENVNC_V4)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - ESDAT (ESDAT)	Email	mkowalczyk@epicenvironmental.com.au
- EDI Format - XTab (XTAB)	Email	mkowalczyk@epicenvironmental.com.au

epic ENVIRONMENTAL

Chain of Custody Record

23 1/11/22 0945

Project No:	BCL220033.01	Lab:	ALS
Project/Site:	CALLIDE	Lab Quote No:	BN/344/21 V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au)	Date Results Required:	
Phone:	#REF!	Sample Disposal After:	
Page:	1 OF 2		
Number of Eskies:	6 ESKIES		

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other Glass	Potable Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025L)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Soil: Total PFAS - 28 Analyte	HOLD
1	BD01_2710	27/10/2022 0:00	SOIL				X																				X	
2	BD02_2710	27/10/2022 0:00	SOIL				X																				X	
3	BD03_2710	27/10/2022 0:00	SOIL				X																				X	
4	BD04_2710	27/10/2022 0:00	SOIL				X																				X	
5	BD05_2710	27/10/2022 0:00	SOIL				X																				X	
6	BD06_2710	27/10/2022 0:00	SOIL				X																				X	
7	BD07_2710	27/10/2022 0:00	SOIL				X																				X	
8	BD08_2710	27/10/2022 0:00	SOIL				X																				X	
9	FOT-A1-V03-0.5	27/10/2022 0:00	SOIL				X																				X	
10	FOT-A1-V03-1.0	27/10/2022 0:00	SOIL				X																				X	
11	FOT-A1-V04-0.5	27/10/2022 0:00	SOIL				X																				X	
12	FOT-A1-V04-1.0	27/10/2022 0:00	SOIL				X																				X	
13	FOT-A1-V05-0.5	27/10/2022 0:00	SOIL				X																				X	
14	FOT-A1-V05-1.0	27/10/2022 0:00	SOIL				X																				X	
15	FOT-A1-V06-0.5	27/10/2022 0:00	SOIL				X																				X	
16	FOT-A1-V06-1.0	27/10/2022 0:00	SOIL				X																				X	
17	FOT-A1-V07-0.5	27/10/2022 0:00	SOIL				X																				X	
18	FOT-A1-V07-1.0	27/10/2022 0:00	SOIL				X																				X	
19	FOT-A1-V08-0.5	27/10/2022 0:00	SOIL				X																				X	
20	FOT-A1-V09-0.5	27/10/2022 0:00	SOIL				X																				X	
21	FOT-A1-V10-0.5	27/10/2022 0:00	SOIL				X																				X	
22	FOT-A1-V11-0.5	27/10/2022 0:00	SOIL				X																				X	
23	FOT-A1-V11-1.0	27/10/2022 0:00	SOIL				X																				X	
24	FOT-A1-V12-0.5	27/10/2022 0:00	SOIL				X																				X	
25	FOT-A1-V12-1.0	27/10/2022 0:00	SOIL				X																				X	
26	FOT-A1-V13-0.5	27/10/2022 0:00	SOIL				X																				X	
27 MISSING	FOT-A1-V13-1.0	27/10/2022 0:00	SOIL				X																				X	
28	FOT-A3-V01-0.5	27/10/2022 0:00	SOIL				X																				X	
29	FOT-A3-V01-1.0	27/10/2022 0:00	SOIL				X																				X	
30	FOT-A3-V02-0.5	27/10/2022 0:00	SOIL				X																				X	

Environmental Division
Brisbane
Work Order Reference
EB2232058

Telephone : +61-7-3243 7222

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Chain of Custody Record

HS 1/11/22 0945

Project No:	BCL220033.01	Lab:	ALS
Project/Site:	CALLIDE	Lab Quote No:	BN/344/21 V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au)	Date Results Required:	
Phone:	#REF!	Sample Disposal After:	
Page:	1 OF 2		
Number of Eskies:	6 ESKIES		

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other Glass	Potable Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - Low Level (EA025L)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Soil: Total PFAS - 28 Analyte	HOLD
31	FOT-A3-V02-1.0	27/10/2022 0:00	SOIL				X																				X	
32	FOT-A3-V03-0.5	27/10/2022 0:00	SOIL				X																				X	
33	FOT-A3-V03-1.0	27/10/2022 0:00	SOIL				X																				X	
34	FOT-A3-V04-0.5	27/10/2022 0:00	SOIL				X																				X	
35	FOT-A3-V04-1.0	27/10/2022 0:00	SOIL				X																				X	
36	FOT-A3-V05-0.5	27/10/2022 0:00	SOIL				X																				X	
37	FOT-A3-V05-1.0	27/10/2022 0:00	SOIL				X																				X	
38	FOT-A3-V06-0.5	27/10/2022 0:00	SOIL				X																				X	
39	FOT-A3-V06-1.0	27/10/2022 0:00	SOIL				X																				X	
40	FOT-A3-V07-0.5	27/10/2022 0:00	SOIL				X																				X	
41	FOT-A3-V07-1.0	27/10/2022 0:00	SOIL				X																				X	
42	FOT-A3-V08-0.5	27/10/2022 0:00	SOIL				X																				X	
43	FOT-A3-V08-1.0	27/10/2022 0:00	SOIL				X																				X	
44	FOT-A3-V09-0.5	27/10/2022 0:00	SOIL				X																				X	
45	FOT-A3-V09-1.0	27/10/2022 0:00	SOIL				X																				X	
46	FOT-A3-V10-0.5	27/10/2022 0:00	SOIL				X																				X	
47	FOT-A3-V10-1.0	27/10/2022 0:00	SOIL				X																				X	
48	FOT-A3-V11-0.5	27/10/2022 0:00	SOIL				X																				X	
49	FOT-A3-V11-1.0	27/10/2022 0:00	SOIL				X																				X	
50	FOT-A3-V12-0.5	27/10/2022 0:00	SOIL				X																				X	
51	FOT-A3-V12-1.0	27/10/2022 0:00	SOIL				X																				X	
52	FOT-A3-V13-0.5	27/10/2022 0:00	SOIL				X																				X	
53	FOT-A3-V13-1.0	27/10/2022 0:00	SOIL				X																				X	
54	FOT-A3-V14-0.5	27/10/2022 0:00	SOIL				X																				X	
55	FOT-A3-V14-1.0	27/10/2022 0:00	SOIL				X																				X	
56	FOT-A3-V15-0.5	27/10/2022 0:00	SOIL				X																				X	
57	FOT-A3-V15-1.0	27/10/2022 0:00	SOIL				X																				X	
58	FOT-A3-V16-0.5	27/10/2022 0:00	SOIL				X																				X	
59	FOT-A3-V16-1.0	27/10/2022 0:00	SOIL				X																				X	
60	FOT-A3-V17-0.5	27/10/2022 0:00	SOIL				X																				X	

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Chain of Custody Record

JS 1/11/22 0945

Project No:	BCL220033.01	Lab:	ALS
Project/Site:	CALLIDE	Lab Quote No:	BN/344/21 V3
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)	Lab Batch No:	
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au)	Date Results Required:	
Phone:	#REF!	Sample Disposal After:	
Page:	1 OF 2		
Number of Eskies:	6 ESKIES		

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other Glass	Potable Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Bore Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - low Level (EA025LL)	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supper Ultra Trace Long Suite (EP231X-SUT)	Soil: Total PFAS - 28 Analyte	HOLD
61	FOT-A3-V17-1.0	27/10/2022 0:00	SOIL				X																				X	
62	FOT-A3-V18-0.5	27/10/2022 0:00	SOIL				X																				X	
63	FOT-A3-V18-1.0	27/10/2022 0:00	SOIL				X																				X	
64	FOT-A4-V01-0.5	27/10/2022 0:00	SOIL				X																				X	
65	FOT-A4-V02-0.5	27/10/2022 0:00	SOIL				X																				X	
66	FOT-A4-V03-0.5	27/10/2022 0:00	SOIL				X																				X	
67	FOT-A4-V04-0.5	27/10/2022 0:00	SOIL				X																				X	
68	FOT-A4-V04-1.0	27/10/2022 0:00	SOIL				X																				X	
69	FOT-A4-V05-0.5	27/10/2022 0:00	SOIL				X																				X	
70	FOT-A4-V05-1.0	27/10/2022 0:00	SOIL				X																				X	
71	FOT-A4-V06-0.5	27/10/2022 0:00	SOIL				X																				X	
72	BD09_2810	28/10/2022 0:00	SOIL				X																				X	
73	BD10_2810	28/10/2022 0:00	SOIL				X																				X	
74	BD11_2810	28/10/2022 0:00	SOIL				X																					
75	FTG-A2-B4A	28/10/2022 0:00	SOIL				X																				X	
76	FTG-A2-B4B	28/10/2022 0:00	SOIL				X																				X	
77	FTG-A2-B6A	28/10/2022 0:00	SOIL				X																				X	
78	FTG-A2-B6C	28/10/2022 0:00	SOIL				X																				X	
79	FTG-A2-V4A-0.5	28/10/2022 0:00	SOIL				X																				X	
80	FTG-A2-V4A-1.0	28/10/2022 0:00	SOIL				X																				X	
81	FTG-A2-V4B-0.5	28/10/2022 0:00	SOIL				X																				X	
82	FTG-A2-V4B-1.0	28/10/2022 0:00	SOIL				X																				X	
83	FTG-A2-V4C-0.5	28/10/2022 0:00	SOIL				X																				X	
84	FTG-A2-V4C-1.0	28/10/2022 0:00	SOIL				X																				X	
85	FTG-A2-V6A-0.5	28/10/2022 0:00	SOIL				X																				X	
86	FTG-A2-V6A-1.0	28/10/2022 0:00	SOIL				X																				X	
87	FTG-A2-V6B-0.5	28/10/2022 0:00	SOIL				X																				X	
88	FTG-A2-V6B-1.0	28/10/2022 0:00	SOIL				X																				X	
89	FTG-A2-V6C-0.5	28/10/2022 0:00	SOIL				X																				X	
90	FTG-A2-V6C-1.0	28/10/2022 0:00	SOIL				X																				X	

epic ENVIRONMENTAL

JS 1/11/22 0945

Chain of Custody Record

Project No:	BCL220033.01
Project/Site:	CALLIDE
Project Manager:	Luke Arnies (larnies@epicenvironmental.com.au)
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au)
Phone:	#REF!
Page:	1 OF 2
Number of Eskies:	6 ESKIES

Lab:	ALS
Lab Quote No:	BN/344/21 V3
Lab Batch No:	
Date Results Required:	
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other Glass	Potable Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Reactive P (EK071G)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	PFAS Supger Ultra Trace Long Suite (EP231X-SUT)	Bore Water: pH (EA005P)	EC (EA010P)	TDS - Standard (EA015H)	Suspended Solids - low Level (EA025[L])	Ammonia (EK055G)	Reactive P (EK071G)	Nitrate and Nitrite (NT-04)	Major Anions/Cations (NT-01 and NT02A)	Ionic Balance (EN055-PG)	Total Metals (Fe and Mn) (EG020T)	PFAS Supger Ultra Trace Long Suite (EP231X-SUT)	Soil: Total PFAS - 28 Analyte	HOLD
91	FTG-A2-V7A-0.5	28/10/2022 0:00	SOIL				X																				X	
92	FTG-A2-V7A-1.0	28/10/2022 0:00	SOIL				X																				X	
93	RB_2710	27/10/2022 13:00	WATER				X																			X		
94	RB_2810	28/10/2022 8:00	WATER				X																			X		
			TOTALS																							2	90	

Relinquished By:

NAME SIGNATURE DATE 31-Oct-22

Received By: KSchafer SIGNATURE DATE 28/10/22

ALS GUIDSTONE

Custody Seals Intact Y N

Samples Received Chilled Y N

Method of Shipment

NOTES: Relinquished by: KSchafer 31.10.22 1600

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au

Chain of Custody Record

Project No:	BCL2200033.01
Project/Site:	CALLIDE
Project Manager:	Luke Amies (lamies@epicenvironmental.com.au)
Sampled By:	Michael Kowalczyk (mkowalczyk@epicenviornmental.com.au)
Phone:	#REF!
Page:	1 OF 2
Number of Eskies:	6 ESKIES

Lab Quote No:	
Lab Batch No:	
Date Results Required:	
Sample Disposal After:	

LAB ID	SAMPLE ID	DATE	MATRIX	60ml Metals	60ml Nutrients	250-500ml Plastic (Unpreserved)	60-250ml Plastic (PFAS)	Other	pH	EC	TDS - Standard	Suspended Solids	Ammonia, Nitrate and Nitrite	Reactive P	Major Cations/Anions	PFAS Ultra Low Level	Total PFAS - 28 Analyte										HOLD
	SD09_2810	28/10/2022 0:00	SOIL				x										x										
	SD10_2810	28/10/2022 0:00	SOIL				x										x										
	SD11_2810	28/10/2022 0:00	SOIL				x																				
	SD01_2710	27/10/2022 0:00	SOIL				x										x										
	SD02_2710	27/10/2022 0:00	SOIL				x										x										
	SD03_2710	27/10/2022 0:00	SOIL				x										x										
	SD04_2710	27/10/2022 0:00	SOIL				x										x										
	SD05_2710	27/10/2022 0:00	SOIL				x										x										
	SD06_2710	27/10/2022 0:00	SOIL				x										x										
	SD07_2710	27/10/2022 0:00	SOIL				x										x										
	SD08_2710	27/10/2022 0:00	SOIL				x										x										

Analysis Required

Relinquished By:				Received By		
NAME	SIGNATURE	DATE	31-Oct-22	SIGNATURE		DATE

Custody Seals Intact	Y	N
Samples Received Chilled	Y	N
Method of Shipment		

NOTES:

Epic Environmental Pty Ltd ABN 54 169 579 275
Level 6, 193 North Quay, Brisbane, 4000/ Suite 4.01, 55 Miller Street, Pyrmont, NSW, 2009

email epicenvironmental@esdat.com.au
email labs@epicenvironmental.com.au

APPENDIX R STATISTICAL ANALYSIS RESULTS

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.2 31/01/2024 12:51:00 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

MW33 PFOS

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	8
Minimum	0.0032	Mean	0.00792
Maximum	0.0144	Median	0.0076
SD	0.00447	Std. Error of Mean	0.002
Coefficient of Variation	0.565	Skewness	0.628

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach, refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance, but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7). The Chebyshev UCL often results in gross overestimates of the mean. Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.686	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.396	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.0122	95% Adjusted-CLT UCL (Chen-1995)	0.0118
		95% Modified-t UCL (Johnson-1978)	0.0123

Gamma GOF Test

A-D Test Statistic	0.202	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.682	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.195	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.359	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	3.772	k star (bias corrected MLE)	1.642
Theta hat (MLE)	0.0021	Theta star (bias corrected MLE)	0.00482
nu hat (MLE)	37.72	nu star (bias corrected)	16.42
MLE Mean (bias corrected)	0.00792	MLE Sd (bias corrected)	0.00618
		Approximate Chi Square Value (0.05)	8.261
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	5.904

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.0157	95% Adjusted Gamma UCL	0.022

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.974	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.806	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.164	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.319	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	-5.745	Mean of logged Data	-4.977
Maximum of Logged Data	-4.241	SD of logged Data	0.603

Assuming Lognormal Distribution

95% H-UCL	0.0223	90% Chebyshev (MVUE) UCL	0.0143
95% Chebyshev (MVUE) UCL	0.0172	97.5% Chebyshev (MVUE) UCL	0.0212
99% Chebyshev (MVUE) UCL	0.029		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	0.0112	95% BCA Bootstrap UCL	0.0112
95% Standard Bootstrap UCL	0.0109	95% Bootstrap-t UCL	0.0134
95% Hall's Bootstrap UCL	0.0137	95% Percentile Bootstrap UCL	0.0111
90% Chebyshev(Mean, Sd) UCL	0.0139	95% Chebyshev(Mean, Sd) UCL	0.0166
97.5% Chebyshev(Mean, Sd) UCL	0.0204	99% Chebyshev(Mean, Sd) UCL	0.0278

Suggested UCL to Use

95% Student's-t UCL	0.0122		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician

MW33 Sum PFOS & PFHxS

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	6
Minimum	0.0032	Mean	0.0125
Maximum	0.0233	Median	0.0119
SD	0.00696	Std. Error of Mean	0.00263
Coefficient of Variation	0.558	Skewness	0.234

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.979	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.73	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.124	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.35	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.0176	95% Adjusted-CLT UCL (Chen-1995)	0.017
		95% Modified-t UCL (Johnson-1978)	0.0176

Gamma GOF Test

A-D Test Statistic	0.22	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.712	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.188	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.314	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level
Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	3.039	k star (bias corrected MLE)	1.832
Theta hat (MLE)	0.0041	Theta star (bias corrected MLE)	0.00681
nu hat (MLE)	42.54	nu star (bias corrected)	25.64
MLE Mean (bias corrected)	0.0125	MLE Sd (bias corrected)	0.00921
		Approximate Chi Square Value (0.05)	15.11
Adjusted Level of Significance	0.0158	Adjusted Chi Square Value	12.73

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.0212	95% Adjusted Gamma UCL	0.0251

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.838	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.226	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.28	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level
Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	-5.745	Mean of logged Data	-4.558
Maximum of Logged Data	-3.759	SD of logged Data	0.69

Assuming Lognormal Distribution

95% H-UCL	0.03	90% Chebyshev (MVUE) UCL	0.0229
95% Chebyshev (MVUE) UCL	0.0275	97.5% Chebyshev (MVUE) UCL	0.0338
99% Chebyshev (MVUE) UCL	0.0463		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	0.0168	95% BCA Bootstrap UCL	0.0168
95% Standard Bootstrap UCL	0.0165	95% Bootstrap-t UCL	0.0182
95% Hall's Bootstrap UCL	0.018	95% Percentile Bootstrap UCL	0.0166
90% Chebyshev(Mean, Sd) UCL	0.0204	95% Chebyshev(Mean, Sd) UCL	0.0239
97.5% Chebyshev(Mean, Sd) UCL	0.0289	99% Chebyshev(Mean, Sd) UCL	0.0386

Suggested UCL to Use

95% Student's-t UCL	0.0176		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician

175											
176											
177	**MW33 Total PFAS**										
178											
179						**General Statistics**					
180					Total Number of Observations	12			Number of Distinct Observations	12	
181									Number of Missing Observations	1	
182					Minimum	0.0124			Mean	0.0758	
183					Maximum	0.193			Median	0.0634	
184					SD	0.0547			Std. Error of Mean	0.0158	
185					Coefficient of Variation	0.721			Skewness	1.279	
186											
187						**Normal GOF Test**					
188					Shapiro Wilk Test Statistic	0.864			**Shapiro Wilk GOF Test**		
189					1% Shapiro Wilk Critical Value	0.805			Data appear Normal at 1% Significance Level		
190					Lilliefors Test Statistic	0.198			**Lilliefors GOF Test**		
191					1% Lilliefors Critical Value	0.281			Data appear Normal at 1% Significance Level		
192						**Data appear Normal at 1% Significance Level**					
193											
194						**Assuming Normal Distribution**					
195					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
196					95% Student's-t UCL	0.104			95% Adjusted-CLT UCL (Chen-1995)	0.108	
197									95% Modified-t UCL (Johnson-1978)	0.105	
198											
199						**Gamma GOF Test**					
200					A-D Test Statistic	0.237			**Anderson-Darling Gamma GOF Test**		
201					5% A-D Critical Value	0.741			Detected data appear Gamma Distributed at 5% Significance Level		
202					K-S Test Statistic	0.113			**Kolmogorov-Smirnov Gamma GOF Test**		
203					5% K-S Critical Value	0.248			Detected data appear Gamma Distributed at 5% Significance Level		
204						**Detected data appear Gamma Distributed at 5% Significance Level**					
205											
206						**Gamma Statistics**					
207					k hat (MLE)	2.241			k star (bias corrected MLE)	1.736	
208					Theta hat (MLE)	0.0338			Theta star (bias corrected MLE)	0.0437	
209					nu hat (MLE)	53.78			nu star (bias corrected)	41.66	
210					MLE Mean (bias corrected)	0.0758			MLE Sd (bias corrected)	0.0576	
211									Approximate Chi Square Value (0.05)	27.87	
212					Adjusted Level of Significance	0.029			Adjusted Chi Square Value	26.16	
213											
214						**Assuming Gamma Distribution**					
215					95% Approximate Gamma UCL	0.113			95% Adjusted Gamma UCL	0.121	
216											
217						**Lognormal GOF Test**					
218					Shapiro Wilk Test Statistic	0.97			**Shapiro Wilk Lognormal GOF Test**		
219					10% Shapiro Wilk Critical Value	0.883			Data appear Lognormal at 10% Significance Level		
220					Lilliefors Test Statistic	0.113			**Lilliefors Lognormal GOF Test**		
221					10% Lilliefors Critical Value	0.223			Data appear Lognormal at 10% Significance Level		
222						**Data appear Lognormal at 10% Significance Level**					
223											
224						**Lognormal Statistics**					
225					Minimum of Logged Data	-4.39			Mean of logged Data	-2.819	
226					Maximum of Logged Data	-1.645			SD of logged Data	0.754	
227											
228						**Assuming Lognormal Distribution**					
229					95% H-UCL	0.14			90% Chebyshev (MVUE) UCL	0.13	
230					95% Chebyshev (MVUE) UCL	0.154			97.5% Chebyshev (MVUE) UCL	0.187	
231					99% Chebyshev (MVUE) UCL	0.252					
232											
233						**Nonparametric Distribution Free UCL Statistics**					
234						**Data appear to follow a Discernible Distribution**					
235											
236						**Nonparametric Distribution Free UCLs**					
237					95% CLT UCL	0.102			95% BCA Bootstrap UCL	0.107	
238					95% Standard Bootstrap UCL	0.101			95% Bootstrap-t UCL	0.124	
239					95% Hall's Bootstrap UCL	0.188			95% Percentile Bootstrap UCL	0.101	
240					90% Chebyshev(Mean, Sd) UCL	0.123			95% Chebyshev(Mean, Sd) UCL	0.145	
241					97.5% Chebyshev(Mean, Sd) UCL	0.174			99% Chebyshev(Mean, Sd) UCL	0.233	
242											
243						**Suggested UCL to Use**					
244					95% Student's-t UCL	0.104					
245											
246	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL										
247	Recommendations are based upon data size, data distribution, and skewness using results from simulation studies										
248	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician										
249											
250											
251	**MW34 PFOS**										
252											
253						**General Statistics**					
254					Total Number of Observations	18			Number of Distinct Observations	16	
255									Number of Missing Observations	0	
256					Minimum	0.0575			Mean	0.125	
257					Maximum	0.195			Median	0.127	
258					SD	0.036			Std. Error of Mean	0.0085	
259					Coefficient of Variation	0.287			Skewness	-0.268	
260											
261						**Normal GOF Test**					

Shapiro Wilk Test Statistic					0.972	**Shapiro Wilk GOF Test**						
1% Shapiro Wilk Critical Value					0.858	Data appear Normal at 1% Significance Level						
Lilliefors Test Statistic					0.122	**Lilliefors GOF Test**						
1% Lilliefors Critical Value					0.235	Data appear Normal at 1% Significance Level						
Data appear Normal at 1% Significance Level												
Assuming Normal Distribution												
95% Normal UCL						**95% UCLs (Adjusted for Skewness)**						
95% Student's-t UCL					0.14	95% Adjusted-CLT UCL (Chen-1995)						0.139
						95% Modified-t UCL (Johnson-1978)						0.14
Gamma GOF Test												
A-D Test Statistic					0.449	**Anderson-Darling Gamma GOF Test**						
5% A-D Critical Value					0.739	Detected data appear Gamma Distributed at 5% Significance Level						
K-S Test Statistic					0.143	**Kolmogorov-Smirnov Gamma GOF Test**						
5% K-S Critical Value					0.203	Detected data appear Gamma Distributed at 5% Significance Level						
Detected data appear Gamma Distributed at 5% Significance Level												
Gamma Statistics												
k hat (MLE)					11.05	k star (bias corrected MLE)						9.249
Theta hat (MLE)					0.0113	Theta star (bias corrected MLE)						0.0136
nu hat (MLE)					397.9	nu star (bias corrected)						332.9
MLE Mean (bias corrected)					0.125	MLE Sd (bias corrected)						0.0412
						Approximate Chi Square Value (0.05)						291.7
Adjusted Level of Significance					0.0357	Adjusted Chi Square Value						288
Assuming Gamma Distribution												
95% Approximate Gamma UCL					0.143	95% Adjusted Gamma UCL						0.145
Lognormal GOF Test												
Shapiro Wilk Test Statistic					0.916	**Shapiro Wilk Lognormal GOF Test**						
10% Shapiro Wilk Critical Value					0.914	Data appear Lognormal at 10% Significance Level						
Lilliefors Test Statistic					0.151	**Lilliefors Lognormal GOF Test**						
10% Lilliefors Critical Value					0.185	Data appear Lognormal at 10% Significance Level						
Data appear Lognormal at 10% Significance Level												
Lognormal Statistics												
Minimum of Logged Data					-2.856	Mean of logged Data						-2.122
Maximum of Logged Data					-1.635	SD of logged Data						0.327
Assuming Lognormal Distribution												
95% H-UCL					0.147	90% Chebyshev (MVUE) UCL						0.156
95% Chebyshev (MVUE) UCL					0.169	97.5% Chebyshev (MVUE) UCL						0.188
99% Chebyshev (MVUE) UCL					0.224							
Nonparametric Distribution Free UCL Statistics												
Data appear to follow a Discernible Distribution												
Nonparametric Distribution Free UCLs												
95% CLT UCL					0.139	95% BCA Bootstrap UCL						0.139
95% Standard Bootstrap UCL					0.139	95% Bootstrap-t UCL						0.139
95% Hall's Bootstrap UCL					0.139	95% Percentile Bootstrap UCL						0.138
90% Chebyshev(Mean, Sd) UCL					0.151	95% Chebyshev(Mean, Sd) UCL						0.162
97.5% Chebyshev(Mean, Sd) UCL					0.178	99% Chebyshev(Mean, Sd) UCL						0.21
Suggested UCL to Use												
95% Student's-t UCL					0.14							
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL												
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies												
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician												
Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be												
reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.												
MW34 Sum PFOS & PFHxS												
General Statistics												
Total Number of Observations					18	Number of Distinct Observations						18
						Number of Missing Observations						0
Minimum					0.136	Mean						0.272
Maximum					0.481	Median						0.258
SD					0.0939	Std. Error of Mean						0.0221
Coefficient of Variation					0.345	Skewness						0.524
Normal GOF Test												
Shapiro Wilk Test Statistic					0.958	**Shapiro Wilk GOF Test**						
1% Shapiro Wilk Critical Value					0.858	Data appear Normal at 1% Significance Level						
Lilliefors Test Statistic					0.14	**Lilliefors GOF Test**						
1% Lilliefors Critical Value					0.235	Data appear Normal at 1% Significance Level						
Data appear Normal at 1% Significance Level												
Assuming Normal Distribution												
95% Normal UCL						**95% UCLs (Adjusted for Skewness)**						
95% Student's-t UCL					0.311	95% Adjusted-CLT UCL (Chen-1995)						0.311
						95% Modified-t UCL (Johnson-1978)						0.311

349												
350						Gamma GOF Test						
351					A-D Test Statistic	0.229	Anderson-Darling Gamma GOF Test					
352					5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level					
353					K-S Test Statistic	0.118	Kolmogorov-Smirnov Gamma GOF Test					
354					5% K-S Critical Value	0.204	Detected data appear Gamma Distributed at 5% Significance Level					
355					Detected data appear Gamma Distributed at 5% Significance Level							
356												
357						Gamma Statistics						
358					k hat (MLE)	8.938	k star (bias corrected MLE)	7.486				
359					Theta hat (MLE)	0.0304	Theta star (bias corrected MLE)	0.0364				
360					nu hat (MLE)	321.8	nu star (bias corrected)	269.5				
361					MLE Mean (bias corrected)	0.272	MLE Sd (bias corrected)	0.0995				
362							Approximate Chi Square Value (0.05)	232.5				
363					Adjusted Level of Significance	0.0357	Adjusted Chi Square Value	229.2				
364												
365						Assuming Gamma Distribution						
366					95% Approximate Gamma UCL	0.315	95% Adjusted Gamma UCL	0.32				
367												
368						Lognormal GOF Test						
369					Shapiro Wilk Test Statistic	0.976	Shapiro Wilk Lognormal GOF Test					
370					10% Shapiro Wilk Critical Value	0.914	Data appear Lognormal at 10% Significance Level					
371					Lilliefors Test Statistic	0.114	Lilliefors Lognormal GOF Test					
372					10% Lilliefors Critical Value	0.185	Data appear Lognormal at 10% Significance Level					
373					Data appear Lognormal at 10% Significance Level							
374												
375						Lognormal Statistics						
376					Minimum of Logged Data	-1.995	Mean of logged Data	-1.359				
377					Maximum of Logged Data	-0.732	SD of logged Data	0.35				
378												
379						Assuming Lognormal Distribution						
380					95% H-UCL	0.321	90% Chebyshev (MVUE) UCL	0.341				
381					95% Chebyshev (MVUE) UCL	0.372	97.5% Chebyshev (MVUE) UCL	0.415				
382					99% Chebyshev (MVUE) UCL	0.5						
383												
384						Nonparametric Distribution Free UCL Statistics						
385						Data appear to follow a Discernible Distribution						
386												
387						Nonparametric Distribution Free UCLs						
388					95% CLT UCL	0.309	95% BCA Bootstrap UCL	0.31				
389					95% Standard Bootstrap UCL	0.307	95% Bootstrap-t UCL	0.317				
390					95% Hall's Bootstrap UCL	0.314	95% Percentile Bootstrap UCL	0.307				
391					90% Chebyshev(Mean, Sd) UCL	0.339	95% Chebyshev(Mean, Sd) UCL	0.369				
392					97.5% Chebyshev(Mean, Sd) UCL	0.41	99% Chebyshev(Mean, Sd) UCL	0.492				
393												
394						Suggested UCL to Use						
395					95% Student's-t UCL	0.311						
396												
397						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL						
398						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies						
399						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician						
400												
401												
402	SW34 Total PFAS											
403												
404						General Statistics						
405					Total Number of Observations	18	Number of Distinct Observations	18				
406							Number of Missing Observations	0				
407					Minimum	0.761	Mean	2.406				
408					Maximum	6.62	Median	2.065				
409					SD	1.487	Std. Error of Mean	0.35				
410					Coefficient of Variation	0.618	Skewness	1.517				
411												
412						Normal GOF Test						
413					Shapiro Wilk Test Statistic	0.862	Shapiro Wilk GOF Test					
414					1% Shapiro Wilk Critical Value	0.858	Data appear Normal at 1% Significance Level					
415					Lilliefors Test Statistic	0.24	Lilliefors GOF Test					
416					1% Lilliefors Critical Value	0.235	Data Not Normal at 1% Significance Level					
417					Data appear Approximate Normal at 1% Significance Level							
418												
419						Assuming Normal Distribution						
420					95% Normal UCL		95% UCLs (Adjusted for Skewness)					
421					95% Student's-t UCL	3.016	95% Adjusted-CLT UCL (Chen-1995)	3.116				
422							95% Modified-t UCL (Johnson-1978)	3.036				
423												
424						Gamma GOF Test						
425					A-D Test Statistic	0.334	Anderson-Darling Gamma GOF Test					
426					5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level					
427					K-S Test Statistic	0.168	Kolmogorov-Smirnov Gamma GOF Test					
428					5% K-S Critical Value	0.205	Detected data appear Gamma Distributed at 5% Significance Level					
429					Detected data appear Gamma Distributed at 5% Significance Level							
430												
431						Gamma Statistics						
432					k hat (MLE)	3.243	k star (bias corrected MLE)	2.739				
433					Theta hat (MLE)	0.742	Theta star (bias corrected MLE)	0.878				
434					nu hat (MLE)	116.7	nu star (bias corrected)	98.61				
435					MLE Mean (bias corrected)	2.406	MLE Sd (bias corrected)	1.454				

436											Approximate Chi Square Value (0.05)	76.7
437				Adjusted Level of Significance		0.0357					Adjusted Chi Square Value	74.85
438												
439						**Assuming Gamma Distribution**						
440				95% Approximate Gamma UCL		3.093					95% Adjusted Gamma UCL	3.17
441												
442						**Lognormal GOF Test**						
443				Shapiro Wilk Test Statistic		0.969		**Shapiro Wilk Lognormal GOF Test**				
444				10% Shapiro Wilk Critical Value		0.914		Data appear Lognormal at 10% Significance Level				
445				Lilliefors Test Statistic		0.132		**Lilliefors Lognormal GOF Test**				
446				10% Lilliefors Critical Value		0.185		Data appear Lognormal at 10% Significance Level				
447						**Data appear Lognormal at 10% Significance Level**						
448												
449						**Lognormal Statistics**						
450				Minimum of Logged Data		-0.273					Mean of logged Data	0.716
451				Maximum of Logged Data		1.89					SD of logged Data	0.586
452												
453						**Assuming Lognormal Distribution**						
454				95% H-UCL		3.278					90% Chebyshev (MVUE) UCL	3.444
455				95% Chebyshev (MVUE) UCL		3.915					97.5% Chebyshev (MVUE) UCL	4.57
456				99% Chebyshev (MVUE) UCL		5.856						
457												
458						**Nonparametric Distribution Free UCL Statistics**						
459						**Data appear to follow a Discernible Distribution**						
460												
461						**Nonparametric Distribution Free UCLs**						
462				95% CLT UCL		2.982					95% BCA Bootstrap UCL	3.208
463				95% Standard Bootstrap UCL		2.981					95% Bootstrap-t UCL	3.305
464				95% Hall's Bootstrap UCL		3.442					95% Percentile Bootstrap UCL	3.013
465				90% Chebyshev(Mean, Sd) UCL		3.457					95% Chebyshev(Mean, Sd) UCL	3.934
466				97.5% Chebyshev(Mean, Sd) UCL		4.595					99% Chebyshev(Mean, Sd) UCL	5.893
467												
468						**Suggested UCL to Use**						
469				95% Student's-t UCL		3.016						
470												
471						When a data set follows an approximate distribution passing only one of the GOF tests						
472						it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL						
473												
474						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL						
475						Recommendations are based upon data size, data distribution, and skewness using results from simulation studies						
476						However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician						
477												

1				**General Statistics on Uncensored Full Data**								
2			Date/Time of Computation	ProUCL 5.2 31/01/2024 12:50:11 PM								
3			**User Selected Options**									
4			From File	WorkSheet.xls								
5			Full Precision	OFF								
6												
7	**From File: WorkSheet.xls**											
8												
9						**General Statistics for Uncensored Data Sets**							
10												
11	**Variable**		**NumObs**	**# Missing**	**Minimum**	**Maximum**	**Mean**	**Geo-Mean**	**SD**	**SEM**	**MAD/0.675**	**Skewness**	**CV**
12	MW33 PFOS		5	8	0.0032	0.0144	0.00792	0.0069	0.00447	0.002	0.0046	0.628	0.565
13	33 Sum PFOS & PFHxS		7	6	0.0032	0.0233	0.0125	0.0105	0.00696	0.00263	0.00934	0.234	0.558
14	MW33 Total PFAS		12	1	0.0124	0.193	0.0758	0.0597	0.0547	0.0158	0.0368	1.279	0.721
15	MW34 PFOS		18	0	0.0575	0.195	0.125	0.12	0.036	0.0085	0.0363	-0.268	0.287
16	34 Sum PFOS & PFHxS		18	0	0.136	0.481	0.272	0.257	0.0939	0.0221	0.116	0.524	0.345
17	SW34 Total PFAS		18	0	0.761	6.62	2.406	2.046	1.487	0.35	0.912	1.517	0.618
18													
19						**Percentiles for Uncensored Data Sets**							
20													
21	**Variable**		**NumObs**	**# Missing**	**10%ile**	**20%ile**	**25%ile(Q1)**	**50%ile(Q2)**	**75%ile(Q3)**	**80%ile**	**90%ile**	**95%ile**	**99%ile**
22	MW33 PFOS		5	8	0.00372	0.00424	0.0045	0.0076	0.0099	0.0108	0.0126	0.0135	0.0142
23	33 Sum PFOS & PFHxS		7	6	0.00464	0.00662	0.00815	0.0119	0.0163	0.0174	0.0202	0.0218	0.023
24	MW33 Total PFAS		12	1	0.0308	0.039	0.0408	0.0634	0.0902	0.0947	0.161	0.179	0.19
25	MW34 PFOS		18	0	0.0766	0.1	0.104	0.127	0.149	0.153	0.16	0.169	0.19
26	34 Sum PFOS & PFHxS		18	0	0.164	0.193	0.212	0.258	0.345	0.355	0.373	0.409	0.467
27	SW34 Total PFAS		18	0	0.871	1.424	1.59	2.065	3.045	3.466	3.983	4.92	6.28

APPENDIX S NORTHERN BOUNDARY SENSOR DATA

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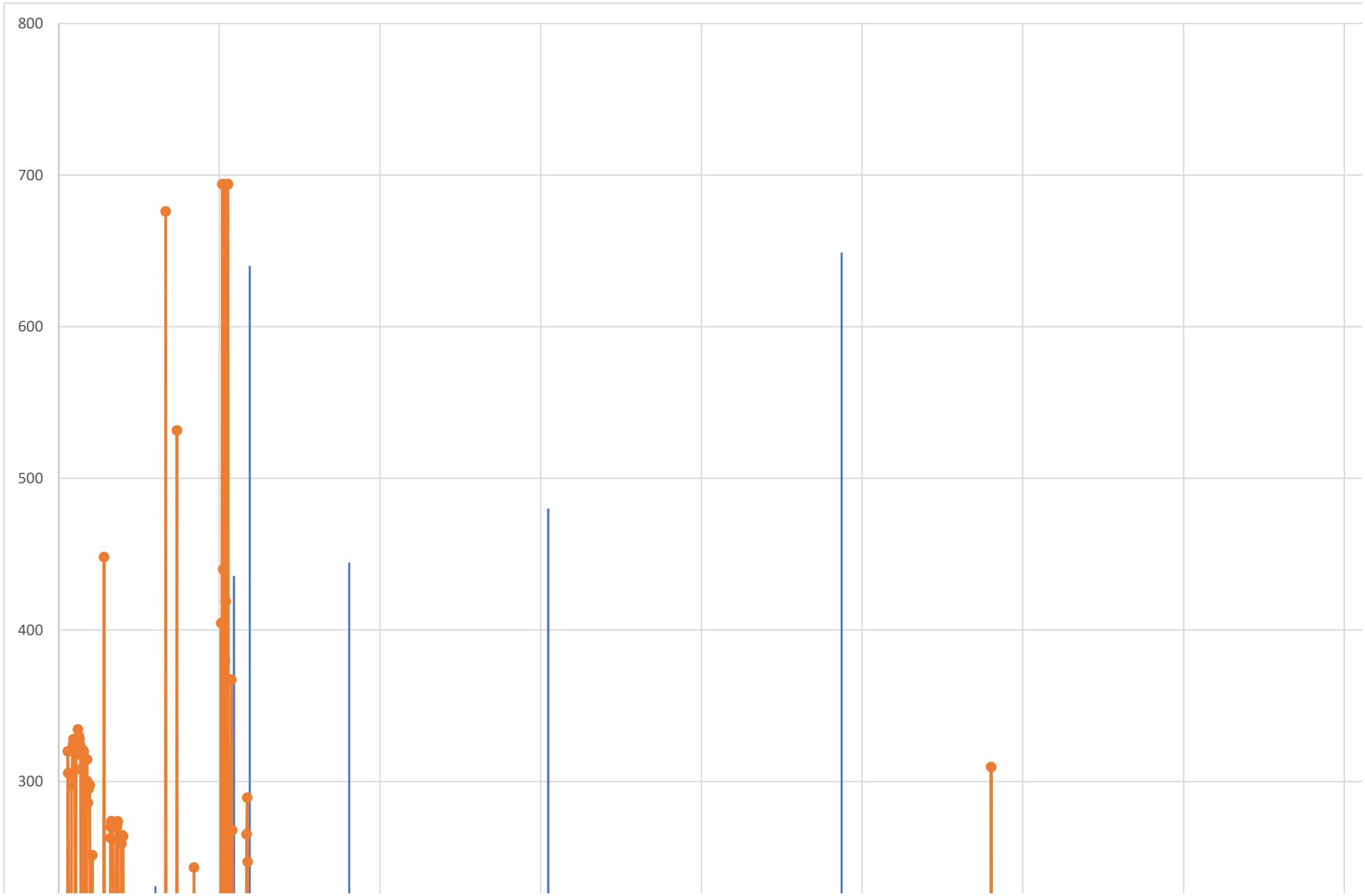
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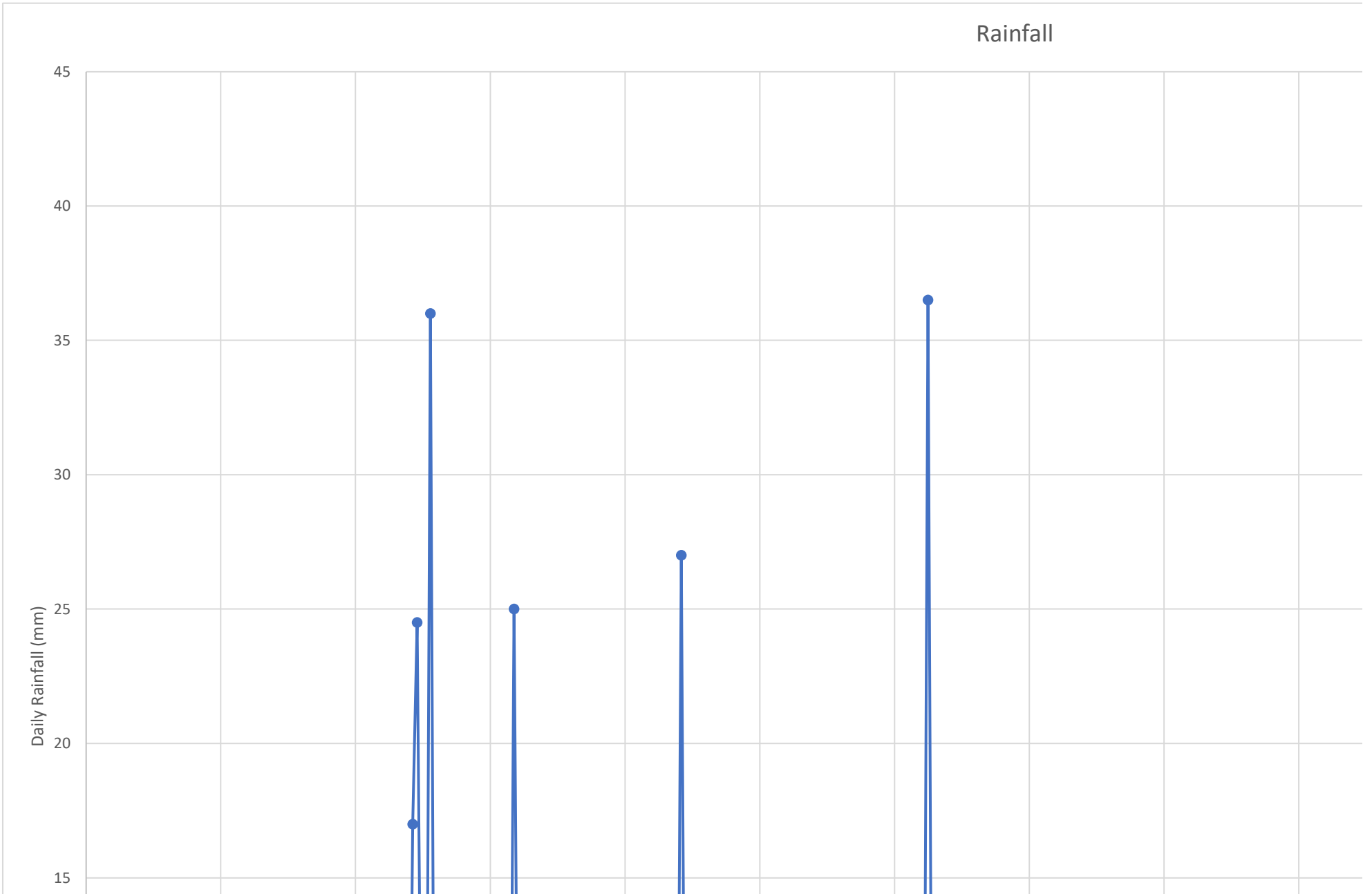
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800
700
600
500
400
300


Rainfall
Daily Rainfall (mm)
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40
35
30
25
20
15

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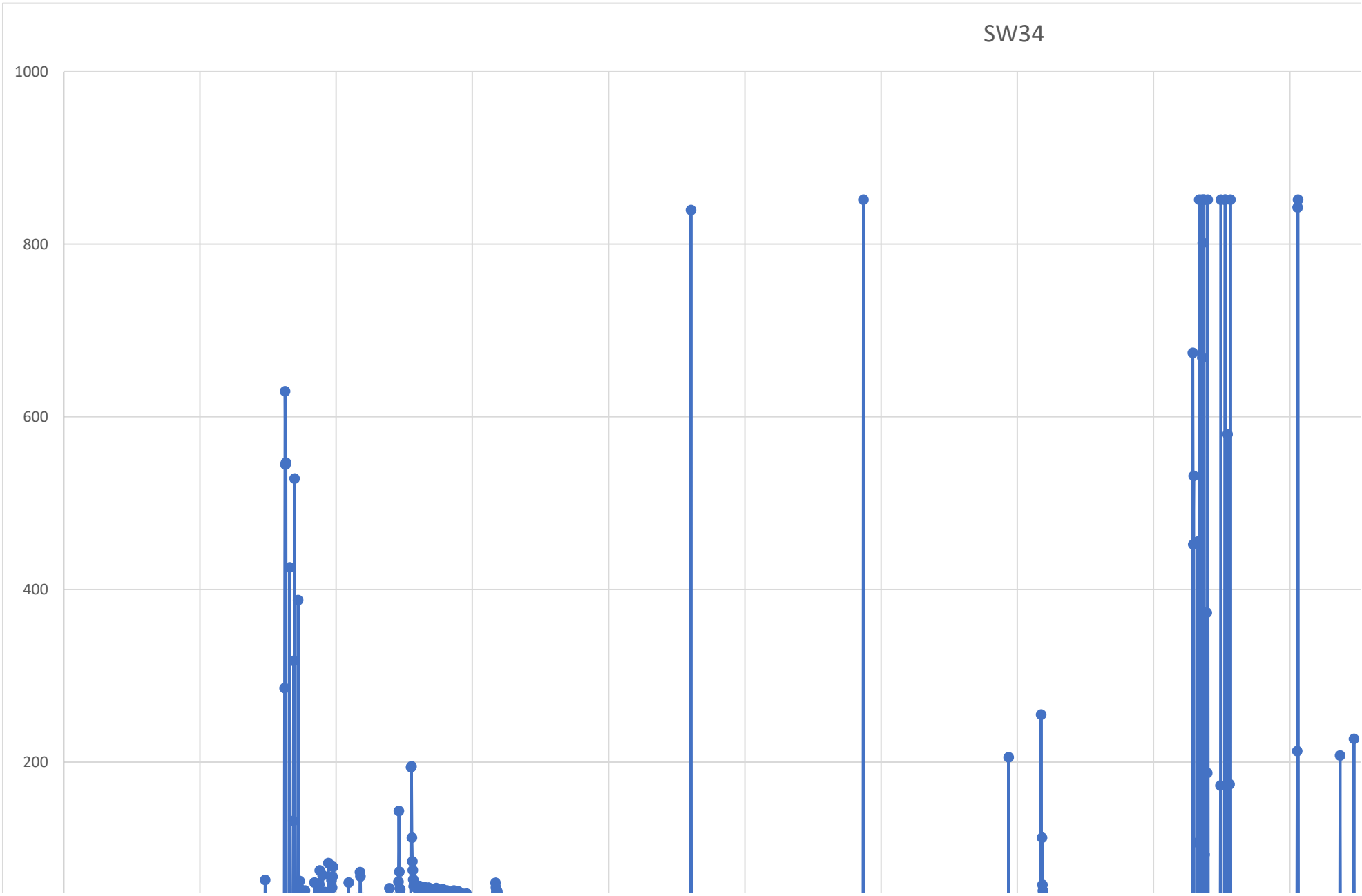
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SW34.Valı	16-Mar-23	51.41
SW34.Valı	16-Mar-23	51.37444
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SW34.Valı	16-Mar-23	49.45246
SW34.Valı	16-Mar-23	54.10222
SW34.Valı	16-Mar-23	55.41
SW34.Valı	16-Mar-23	54.56982
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SW34.Valı	17-Mar-23	50.41
SW34.Valı	17-Mar-23	52.49
SW34.Valı	17-Mar-23	50.50434
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SW34.Valı	17-Mar-23	50.41
SW34.Valı	17-Mar-23	51.32362
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SW34.Valı	20-Mar-23	50.61667
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SW34.Valı	21-Mar-23	48.28222
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SW34.Valı	21-Mar-23	46.03444
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SW34.Valı	25-Mar-23	43.41

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SW34.Valı	26-Mar-23	43.41
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SW34.Valı	30-Apr-23	11.34778
SW34.Valı	30-Apr-23	17.00755
SW34.Valı	30-Apr-23	15.41
SW34.Valı	30-Apr-23	9.985236
SW34.Valı	30-Apr-23	4.506667
SW34.Valı	30-Apr-23	1.046667
SW34.Valı	01-May-23	5.04
SW34.Valı	01-May-23	3.827314
SW34.Valı	01-May-23	1.707778
SW34.Valı	01-May-23	11.98111
SW34.Valı	01-May-23	16.56269
SW34.Valı	01-May-23	15.41
SW34.Valı	01-May-23	12.10103
SW34.Valı	01-May-23	10.88222
SW34.Valı	01-May-23	7.649155
SW34.Valı	01-May-23	11.33
SW34.Valı	02-May-23	12.11667
SW34.Valı	02-May-23	10.73186
SW34.Valı	02-May-23	10.14333
SW34.Valı	02-May-23	16.04111
SW34.Valı	02-May-23	15.05151

SW34.Valı	02-May-23	14.78514
SW34.Valı	02-May-23	13.19362
SW34.Valı	02-May-23	10.56778
SW34.Valı	02-May-23	11.52667
SW34.Valı	03-May-23	10.41
SW34.Valı	03-May-23	3.366667
SW34.Valı	03-May-23	9.41
SW34.Valı	03-May-23	8.393389
SW34.Valı	03-May-23	12.92279
SW34.Valı	03-May-23	12.45444
SW34.Valı	03-May-23	14.41
SW34.Valı	03-May-23	8.854444
SW34.Valı	03-May-23	9.121902
SW34.Valı	03-May-23	5.234444
SW34.Valı	04-May-23	2.992222
SW34.Valı	04-May-23	0.41
SW34.Valı	04-May-23	5.523333
SW34.Valı	04-May-23	11.25667
SW34.Valı	04-May-23	17.25
SW34.Valı	04-May-23	14.09701
SW34.Valı	04-May-23	12.60111
SW34.Valı	04-May-23	13.19111
SW34.Valı	04-May-23	4.816459
SW34.Valı	04-May-23	5.659446
SW34.Valı	05-May-23	7.427778
SW34.Valı	05-May-23	8.41
SW34.Valı	05-May-23	3.41
SW34.Valı	05-May-23	12.22778
SW34.Valı	05-May-23	15.99333
SW34.Valı	05-May-23	14.06
SW34.Valı	05-May-23	10.25872
SW34.Valı	05-May-23	10.29222
SW34.Valı	05-May-23	8.41
SW34.Valı	05-May-23	11.74962
SW34.Valı	06-May-23	8.456667
SW34.Valı	06-May-23	4.41
SW34.Valı	06-May-23	8.195556
SW34.Valı	06-May-23	1.41
SW34.Valı	06-May-23	-3.14494
SW34.Valı	06-May-23	0.223333
SW34.Valı	06-May-23	3.13
SW34.Valı	06-May-23	6.50212
SW34.Valı	06-May-23	11.41
SW34.Valı	06-May-23	8.655575
SW34.Valı	07-May-23	10.06444
SW34.Valı	07-May-23	4.798457
SW34.Valı	07-May-23	5.532222
SW34.Valı	07-May-23	10.12111
SW34.Valı	07-May-23	12.76738
SW34.Valı	07-May-23	14.44
SW34.Valı	07-May-23	8.46673
SW34.Valı	07-May-23	8.827778
SW34.Valı	07-May-23	6.738889

SW34.Valı	07-May-23	6.385501
SW34.Valı	08-May-23	6.401111
SW34.Valı	08-May-23	7.134444
SW34.Valı	08-May-23	7.598333
SW34.Valı	08-May-23	14.41
SW34.Valı	08-May-23	12.48444
SW34.Valı	08-May-23	10.41
SW34.Valı	08-May-23	13.80333
SW34.Valı	08-May-23	6.41
SW34.Valı	08-May-23	8.57574
SW34.Valı	08-May-23	6.816667
SW34.Valı	09-May-23	18.41
SW34.Valı	09-May-23	1.471111
SW34.Valı	09-May-23	-3.17935
SW34.Valı	09-May-23	14.17471
SW34.Valı	09-May-23	13.19333
SW34.Valı	09-May-23	9.418889
SW34.Valı	09-May-23	7.223333
SW34.Valı	09-May-23	2.41
SW34.Valı	09-May-23	3.606667
SW34.Valı	10-May-23	3.27
SW34.Valı	10-May-23	-2.26111
SW34.Valı	10-May-23	-1.00333
SW34.Valı	10-May-23	-2.59
SW34.Valı	10-May-23	17.27333
SW34.Valı	10-May-23	1.007778
SW34.Valı	10-May-23	-9.35477
SW34.Valı	10-May-23	3.475556
SW34.Valı	10-May-23	1.012664
SW34.Valı	10-May-23	2.538889
SW34.Valı	11-May-23	-26.6656
SW34.Valı	11-May-23	-4.58667
SW34.Valı	11-May-23	8.41
SW34.Valı	11-May-23	11.34437
SW34.Valı	11-May-23	12.00822
SW34.Valı	11-May-23	1.676667
SW34.Valı	11-May-23	4.413333
SW34.Valı	11-May-23	2.215
SW34.Valı	11-May-23	12.00622
SW34.Valı	11-May-23	19.14556
SW34.Valı	12-May-23	19.01222
SW34.Valı	12-May-23	-15.2724
SW34.Valı	12-May-23	2.927778
SW34.Valı	12-May-23	-13
SW34.Valı	12-May-23	-27.2837
SW34.Valı	12-May-23	-28.16
SW34.Valı	12-May-23	-22.6033
SW34.Valı	12-May-23	-26.6389
SW34.Valı	12-May-23	3.645556
SW34.Valı	12-May-23	6.592222
SW34.Valı	13-May-23	7.347847
SW34.Valı	13-May-23	-1.59
SW34.Valı	13-May-23	-16.59

SW34.Valı	13-May-23	-21.4511
SW34.Valı	13-May-23	-25.1567
SW34.Valı	13-May-23	-20.0367
SW34.Valı	13-May-23	-22.31
SW34.Valı	13-May-23	-14.6812
SW34.Valı	13-May-23	7.025556
SW34.Valı	13-May-23	7.868287
SW34.Valı	14-May-23	10.86111
SW34.Valı	14-May-23	-13.5278
SW34.Valı	14-May-23	-14.8167
SW34.Valı	14-May-23	-10.7967
SW34.Valı	14-May-23	-24.2167
SW34.Valı	14-May-23	-27.8681
SW34.Valı	14-May-23	-31.59
SW34.Valı	14-May-23	1.001518
SW34.Valı	14-May-23	-22.1595
SW34.Valı	14-May-23	-20.0783
SW34.Valı	15-May-23	-21.0344
SW34.Valı	15-May-23	-22.59
SW34.Valı	15-May-23	-22.6689
SW34.Valı	15-May-23	-26.7778
SW34.Valı	15-May-23	-69.4979
SW34.Valı	15-May-23	-55.35
SW34.Valı	15-May-23	839.5301
SW34.Valı	15-May-23	-31.59
SW34.Valı	15-May-23	-30.59
SW34.Valı	15-May-23	-19.3033
SW34.Valı	16-May-23	-21.6923
SW34.Valı	16-May-23	-23.8625
SW34.Valı	16-May-23	-8.59
SW34.Valı	16-May-23	-35.9944
SW34.Valı	16-May-23	-27.9429
SW34.Valı	16-May-23	-41.7733
SW34.Valı	16-May-23	-23.9378
SW34.Valı	16-May-23	-23.3492
SW34.Valı	16-May-23	-19.5458
SW34.Valı	16-May-23	-5.59
SW34.Valı	17-May-23	-16.8744
SW34.Valı	17-May-23	-17.5544
SW34.Valı	17-May-23	-28.8414
SW34.Valı	17-May-23	-20.5278
SW34.Valı	17-May-23	-19.5086
SW34.Valı	17-May-23	2.027778
SW34.Valı	17-May-23	-5.01778
SW34.Valı	17-May-23	-19.49
SW34.Valı	17-May-23	-18.2078
SW34.Valı	18-May-23	-21.59
SW34.Valı	18-May-23	-22.93
SW34.Valı	18-May-23	-15.1116
SW34.Valı	18-May-23	-20.4144
SW34.Valı	18-May-23	-15.9514
SW34.Valı	18-May-23	-14.1449
SW34.Valı	18-May-23	-11.0344

SW34.Valı	18-May-23	-19.7038
SW34.Valı	18-May-23	-25.8592
SW34.Valı	18-May-23	-21.0789
SW34.Valı	19-May-23	-12.8133
SW34.Valı	19-May-23	-7.63333
SW34.Valı	19-May-23	-10.9616
SW34.Valı	19-May-23	-2.82973
SW34.Valı	19-May-23	-4.82
SW34.Valı	19-May-23	-8.87667
SW34.Valı	19-May-23	-9.97
SW34.Valı	19-May-23	-31.2693
SW34.Valı	19-May-23	-28.3133
SW34.Valı	19-May-23	-25.9456
SW34.Valı	20-May-23	-15.0661
SW34.Valı	20-May-23	-16.1744
SW34.Valı	20-May-23	-19.5367
SW34.Valı	20-May-23	-10.35
SW34.Valı	20-May-23	-21.5767
SW34.Valı	20-May-23	-28.8173
SW34.Valı	20-May-23	16.61
SW34.Valı	20-May-23	17.41
SW34.Valı	20-May-23	13.26556
SW34.Valı	20-May-23	5.572042
SW34.Valı	21-May-23	-36.2307
SW34.Valı	21-May-23	-34.91
SW34.Valı	21-May-23	14.50656
SW34.Valı	21-May-23	21.31444
SW34.Valı	21-May-23	1.170266
SW34.Valı	21-May-23	-12.3705
SW34.Valı	21-May-23	21.63
SW34.Valı	21-May-23	15.41
SW34.Valı	21-May-23	17.35983
SW34.Valı	21-May-23	2.450134
SW34.Valı	22-May-23	-27.2833
SW34.Valı	22-May-23	-11.884
SW34.Valı	22-May-23	14.16682
SW34.Valı	22-May-23	-1.06333
SW34.Valı	22-May-23	-1.25889
SW34.Valı	22-May-23	14.61222
SW34.Valı	22-May-23	13.14415
SW34.Valı	22-May-23	-19.59
SW34.Valı	22-May-23	8.21
SW34.Valı	22-May-23	18.41
SW34.Valı	23-May-23	19.97667
SW34.Valı	23-May-23	17.81
SW34.Valı	23-May-23	13.87667
SW34.Valı	23-May-23	15.41
SW34.Valı	23-May-23	-25.5811
SW34.Valı	23-May-23	-7.65222
SW34.Valı	23-May-23	8.658889
SW34.Valı	23-May-23	-13.9411
SW34.Valı	23-May-23	-16.7709
SW34.Valı	23-May-23	-16.55

SW34.Valı	24-May-23	-18.6383
SW34.Valı	24-May-23	-19.68
SW34.Valı	24-May-23	-12.96
SW34.Valı	24-May-23	17.96172
SW34.Valı	24-May-23	1.41
SW34.Valı	24-May-23	-1.01667
SW34.Valı	24-May-23	-7.50333
SW34.Valı	24-May-23	-9.47346
SW34.Valı	24-May-23	-16.59
SW34.Valı	25-May-23	-21.1511
SW34.Valı	25-May-23	-17.1122
SW34.Valı	25-May-23	-15.7567
SW34.Valı	25-May-23	-16.1782
SW34.Valı	25-May-23	11.97
SW34.Valı	25-May-23	-11.11
SW34.Valı	25-May-23	-12.7765
SW34.Valı	25-May-23	-18.3078
SW34.Valı	25-May-23	-6.1288
SW34.Valı	25-May-23	-17.6978
SW34.Valı	26-May-23	-23.16
SW34.Valı	26-May-23	-15.7411
SW34.Valı	26-May-23	-12.8989
SW34.Valı	26-May-23	-21.3787
SW34.Valı	26-May-23	-24.1411
SW34.Valı	26-May-23	-17.59
SW34.Valı	26-May-23	-22.105
SW34.Valı	26-May-23	-13.6833
SW34.Valı	26-May-23	-14.459
SW34.Valı	26-May-23	19.96556
SW34.Valı	27-May-23	19.58719
SW34.Valı	27-May-23	22.45444
SW34.Valı	27-May-23	24.05444
SW34.Valı	27-May-23	-9.07444
SW34.Valı	27-May-23	0.624444
SW34.Valı	27-May-23	20.08817
SW34.Valı	27-May-23	10.41
SW34.Valı	27-May-23	19.09667
SW34.Valı	27-May-23	22.36344
SW34.Valı	27-May-23	22.19
SW34.Valı	28-May-23	21.89556
SW34.Valı	28-May-23	23.15333
SW34.Valı	28-May-23	16.39111
SW34.Valı	28-May-23	11.82953
SW34.Valı	28-May-23	-0.35111
SW34.Valı	28-May-23	0.965556
SW34.Valı	28-May-23	23.32556
SW34.Valı	28-May-23	19.70922
SW34.Valı	28-May-23	22.79222
SW34.Valı	28-May-23	21.41
SW34.Valı	29-May-23	22.335
SW34.Valı	29-May-23	22.66
SW34.Valı	29-May-23	18.45772
SW34.Valı	29-May-23	-5.64006

SW34.Valı	29-May-23	22.27222
SW34.Valı	29-May-23	23.41
SW34.Valı	29-May-23	19.41111
SW34.Valı	29-May-23	23.41
SW34.Valı	29-May-23	23.1292
SW34.Valı	29-May-23	22.41
SW34.Valı	30-May-23	21.41
SW34.Valı	30-May-23	17.41
SW34.Valı	30-May-23	18.41
SW34.Valı	30-May-23	19.63531
SW34.Valı	30-May-23	24.65
SW34.Valı	30-May-23	22.70333
SW34.Valı	30-May-23	20.41
SW34.Valı	30-May-23	19.41
SW34.Valı	30-May-23	23.30111
SW34.Valı	30-May-23	17.62135
SW34.Valı	31-May-23	18.41
SW34.Valı	31-May-23	16.19889
SW34.Valı	31-May-23	16.42111
SW34.Valı	31-May-23	16.41
SW34.Valı	31-May-23	25.32111
SW34.Valı	31-May-23	28.79
SW34.Valı	31-May-23	20.41
SW34.Valı	31-May-23	16.43886
SW34.Valı	31-May-23	21.01957
SW34.Valı	01-Jun-23	20.28556
SW34.Valı	01-Jun-23	22.84493
SW34.Valı	01-Jun-23	23.41
SW34.Valı	01-Jun-23	18.11222
SW34.Valı	01-Jun-23	26.76294
SW34.Valı	01-Jun-23	22.78667
SW34.Valı	01-Jun-23	24.98825
SW34.Valı	01-Jun-23	24.28048
SW34.Valı	01-Jun-23	21.40333
SW34.Valı	01-Jun-23	24.86495
SW34.Valı	02-Jun-23	24.41
SW34.Valı	02-Jun-23	23.23016
SW34.Valı	02-Jun-23	22.98682
SW34.Valı	02-Jun-23	22.74348
SW34.Valı	02-Jun-23	22.50014
SW34.Valı	02-Jun-23	22.2568
SW34.Valı	02-Jun-23	22.01345
SW34.Valı	02-Jun-23	21.77011
SW34.Valı	02-Jun-23	21.52677
SW34.Valı	02-Jun-23	21.28343
SW34.Valı	03-Jun-23	21.04009
SW34.Valı	03-Jun-23	20.79675
SW34.Valı	03-Jun-23	20.55341
SW34.Valı	03-Jun-23	20.31007
SW34.Valı	03-Jun-23	20.06672
SW34.Valı	03-Jun-23	19.82338
SW34.Valı	03-Jun-23	19.58004
SW34.Valı	03-Jun-23	19.3367

SW34.Valı	03-Jun-23	19.09336
SW34.Valı	03-Jun-23	18.85002
SW34.Valı	04-Jun-23	18.60668
SW34.Valı	04-Jun-23	18.36334
SW34.Valı	04-Jun-23	18.12
SW34.Valı	04-Jun-23	17.87665
SW34.Valı	04-Jun-23	17.63331
SW34.Valı	04-Jun-23	17.38997
SW34.Valı	04-Jun-23	17.14663
SW34.Valı	04-Jun-23	16.90329
SW34.Valı	04-Jun-23	16.65995
SW34.Valı	04-Jun-23	16.41661
SW34.Valı	05-Jun-23	16.17327
SW34.Valı	05-Jun-23	15.92992
SW34.Valı	05-Jun-23	15.68658
SW34.Valı	05-Jun-23	15.44324
SW34.Valı	05-Jun-23	15.1999
SW34.Valı	05-Jun-23	14.95656
SW34.Valı	05-Jun-23	14.71322
SW34.Valı	05-Jun-23	14.46988
SW34.Valı	05-Jun-23	14.22654
SW34.Valı	05-Jun-23	13.98319
SW34.Valı	06-Jun-23	13.73985
SW34.Valı	06-Jun-23	13.49651
SW34.Valı	06-Jun-23	13.25317
SW34.Valı	06-Jun-23	13.00983
SW34.Valı	06-Jun-23	12.76649
SW34.Valı	06-Jun-23	12.52315
SW34.Valı	06-Jun-23	12.27981
SW34.Valı	06-Jun-23	12.03646
SW34.Valı	06-Jun-23	11.79312
SW34.Valı	06-Jun-23	11.54978
SW34.Valı	07-Jun-23	11.30644
SW34.Valı	07-Jun-23	11.0631
SW34.Valı	07-Jun-23	10.81976
SW34.Valı	07-Jun-23	10.57642
SW34.Valı	07-Jun-23	10.33308
SW34.Valı	07-Jun-23	10.08973
SW34.Valı	07-Jun-23	9.846394
SW34.Valı	07-Jun-23	9.603053
SW34.Valı	07-Jun-23	9.359711
SW34.Valı	07-Jun-23	9.11637
SW34.Valı	08-Jun-23	8.873029
SW34.Valı	08-Jun-23	8.629688
SW34.Valı	08-Jun-23	8.386346
SW34.Valı	08-Jun-23	8.143005
SW34.Valı	08-Jun-23	7.899664
SW34.Valı	08-Jun-23	7.656323
SW34.Valı	08-Jun-23	7.412982
SW34.Valı	08-Jun-23	7.16964
SW34.Valı	08-Jun-23	6.926299
SW34.Valı	09-Jun-23	6.682958
SW34.Valı	09-Jun-23	6.439617

SW34.Valı	09-Jun-23	6.196275
SW34.Valı	09-Jun-23	5.952934
SW34.Valı	09-Jun-23	5.709593
SW34.Valı	09-Jun-23	5.466252
SW34.Valı	09-Jun-23	8.026667
SW34.Valı	09-Jun-23	9.41
SW34.Valı	09-Jun-23	9.260166
SW34.Valı	09-Jun-23	6.726667
SW34.Valı	10-Jun-23	17.08111
SW34.Valı	10-Jun-23	16.95384
SW34.Valı	10-Jun-23	0.212002
SW34.Valı	10-Jun-23	14.83158
SW34.Valı	10-Jun-23	14.41
SW34.Valı	10-Jun-23	12.49667
SW34.Valı	10-Jun-23	-18.9833
SW34.Valı	10-Jun-23	12.19865
SW34.Valı	10-Jun-23	13.98333
SW34.Valı	10-Jun-23	18.34674
SW34.Valı	11-Jun-23	9.89
SW34.Valı	11-Jun-23	-2.68934
SW34.Valı	11-Jun-23	-13.59
SW34.Valı	11-Jun-23	-6
SW34.Valı	11-Jun-23	6.475628
SW34.Valı	11-Jun-23	-0.07053
SW34.Valı	11-Jun-23	5.424493
SW34.Valı	11-Jun-23	-11.59
SW34.Valı	11-Jun-23	-28.3456
SW34.Valı	11-Jun-23	-16.9467
SW34.Valı	12-Jun-23	-18.66
SW34.Valı	12-Jun-23	-17.59
SW34.Valı	12-Jun-23	-19.9263
SW34.Valı	12-Jun-23	-15.59
SW34.Valı	12-Jun-23	-10.7856
SW34.Valı	12-Jun-23	-15.77
SW34.Valı	12-Jun-23	-23.1483
SW34.Valı	12-Jun-23	-19.59
SW34.Valı	12-Jun-23	-12.7953
SW34.Valı	12-Jun-23	-16.59
SW34.Valı	13-Jun-23	-12.59
SW34.Valı	13-Jun-23	-12.23
SW34.Valı	13-Jun-23	-4.65667
SW34.Valı	13-Jun-23	14.78333
SW34.Valı	13-Jun-23	10.0496
SW34.Valı	13-Jun-23	-29.0233
SW34.Valı	13-Jun-23	5.238699
SW34.Valı	13-Jun-23	5.792647
SW34.Valı	13-Jun-23	-6.20556
SW34.Valı	13-Jun-23	-20.4744
SW34.Valı	14-Jun-23	-11.0151
SW34.Valı	14-Jun-23	-21.0944
SW34.Valı	14-Jun-23	-21.67
SW34.Valı	14-Jun-23	-3.1183
SW34.Valı	14-Jun-23	0.712558

SW34.Valı	14-Jun-23	3.84
SW34.Valı	14-Jun-23	10.08111
SW34.Valı	14-Jun-23	16.41
SW34.Valı	14-Jun-23	18.41
SW34.Valı	14-Jun-23	10.41
SW34.Valı	15-Jun-23	13.41
SW34.Valı	15-Jun-23	14.08111
SW34.Valı	15-Jun-23	15.01377
SW34.Valı	15-Jun-23	14.26008
SW34.Valı	15-Jun-23	8.41
SW34.Valı	15-Jun-23	8.875998
SW34.Valı	15-Jun-23	5.91
SW34.Valı	15-Jun-23	-15.9156
SW34.Valı	15-Jun-23	10.50667
SW34.Valı	16-Jun-23	12.30667
SW34.Valı	16-Jun-23	13.41
SW34.Valı	16-Jun-23	12.73889
SW34.Valı	16-Jun-23	0.583333
SW34.Valı	16-Jun-23	-6.21667
SW34.Valı	16-Jun-23	8.778889
SW34.Valı	16-Jun-23	10.61644
SW34.Valı	16-Jun-23	-34.4267
SW34.Valı	16-Jun-23	-16.76
SW34.Valı	16-Jun-23	-7.28778
SW34.Valı	17-Jun-23	-19.7368
SW34.Valı	17-Jun-23	-11.8922
SW34.Valı	17-Jun-23	-15.0944
SW34.Valı	17-Jun-23	-12.0656
SW34.Valı	17-Jun-23	-18.3011
SW34.Valı	17-Jun-23	-22.8233
SW34.Valı	17-Jun-23	9.970488
SW34.Valı	17-Jun-23	-3.25667
SW34.Valı	17-Jun-23	-22.2511
SW34.Valı	17-Jun-23	-15.23
SW34.Valı	18-Jun-23	-9.21667
SW34.Valı	18-Jun-23	-8.69679
SW34.Valı	18-Jun-23	-9.43093
SW34.Valı	18-Jun-23	-3.15
SW34.Valı	18-Jun-23	-12.8178
SW34.Valı	18-Jun-23	-26.7544
SW34.Valı	18-Jun-23	-24.5025
SW34.Valı	18-Jun-23	12.37444
SW34.Valı	18-Jun-23	-17.8633
SW34.Valı	18-Jun-23	-10.6144
SW34.Valı	19-Jun-23	-21.2611
SW34.Valı	19-Jun-23	20.52333
SW34.Valı	19-Jun-23	24.23333
SW34.Valı	19-Jun-23	26.59
SW34.Valı	19-Jun-23	-5.84083
SW34.Valı	19-Jun-23	-18.3192
SW34.Valı	19-Jun-23	-26.3569
SW34.Valı	19-Jun-23	-19.7456
SW34.Valı	19-Jun-23	-3.43351

SW34.Valı	19-Jun-23	-14.5267
SW34.Valı	20-Jun-23	-15.4989
SW34.Valı	20-Jun-23	-5.14778
SW34.Valı	20-Jun-23	-1.12829
SW34.Valı	20-Jun-23	19.91667
SW34.Valı	20-Jun-23	-4.59
SW34.Valı	20-Jun-23	-6.73238
SW34.Valı	20-Jun-23	12.62088
SW34.Valı	20-Jun-23	-13.9522
SW34.Valı	20-Jun-23	21.36778
SW34.Valı	20-Jun-23	20.76222
SW34.Valı	21-Jun-23	24.41
SW34.Valı	21-Jun-23	13.13889
SW34.Valı	21-Jun-23	21.01444
SW34.Valı	21-Jun-23	-12.9056
SW34.Valı	21-Jun-23	-14.0067
SW34.Valı	21-Jun-23	-2.74
SW34.Valı	21-Jun-23	-12.2189
SW34.Valı	21-Jun-23	-12.418
SW34.Valı	21-Jun-23	-13.0789
SW34.Valı	21-Jun-23	-16.5744
SW34.Valı	22-Jun-23	-8.87222
SW34.Valı	22-Jun-23	-4.39444
SW34.Valı	22-Jun-23	-2.40556
SW34.Valı	22-Jun-23	-10.2656
SW34.Valı	22-Jun-23	-10.5056
SW34.Valı	22-Jun-23	-11.06
SW34.Valı	22-Jun-23	-18.5188
SW34.Valı	22-Jun-23	-14.4643
SW34.Valı	22-Jun-23	-18.9385
SW34.Valı	23-Jun-23	-21.59
SW34.Valı	23-Jun-23	-23.2633
SW34.Valı	23-Jun-23	-32.59
SW34.Valı	23-Jun-23	-37.1551
SW34.Valı	23-Jun-23	851.41
SW34.Valı	23-Jun-23	-37.6233
SW34.Valı	23-Jun-23	-17.1456
SW34.Valı	23-Jun-23	-17.2218
SW34.Valı	23-Jun-23	18.885
SW34.Valı	23-Jun-23	19.41
SW34.Valı	24-Jun-23	23.75333
SW34.Valı	24-Jun-23	24.02
SW34.Valı	24-Jun-23	19.41
SW34.Valı	24-Jun-23	17.02333
SW34.Valı	24-Jun-23	5.754828
SW34.Valı	24-Jun-23	-4.28778
SW34.Valı	24-Jun-23	2.292222
SW34.Valı	24-Jun-23	0.578889
SW34.Valı	24-Jun-23	4.833333
SW34.Valı	24-Jun-23	14.67
SW34.Valı	25-Jun-23	1.437809
SW34.Valı	25-Jun-23	17.13667
SW34.Valı	25-Jun-23	-1.97333

SW34.Valı	25-Jun-23	-2.14556
SW34.Valı	25-Jun-23	16.11
SW34.Valı	25-Jun-23	26.73143
SW34.Valı	25-Jun-23	5.805556
SW34.Valı	25-Jun-23	16.76556
SW34.Valı	25-Jun-23	12.06333
SW34.Valı	25-Jun-23	-11.59
SW34.Valı	26-Jun-23	17.08
SW34.Valı	26-Jun-23	-84.03
SW34.Valı	26-Jun-23	-20.3867
SW34.Valı	26-Jun-23	-20.59
SW34.Valı	26-Jun-23	-5.26519
SW34.Valı	26-Jun-23	22.40778
SW34.Valı	26-Jun-23	24.09889
SW34.Valı	26-Jun-23	-17.7254
SW34.Valı	26-Jun-23	-20.1894
SW34.Valı	26-Jun-23	-20.59
SW34.Valı	27-Jun-23	-21.59
SW34.Valı	27-Jun-23	-23.19
SW34.Valı	27-Jun-23	-22.0528
SW34.Valı	27-Jun-23	-20.1233
SW34.Valı	27-Jun-23	-19.386
SW34.Valı	27-Jun-23	8.078889
SW34.Valı	27-Jun-23	-2.72556
SW34.Valı	27-Jun-23	-9.40201
SW34.Valı	27-Jun-23	-5.19821
SW34.Valı	27-Jun-23	28.33444
SW34.Valı	28-Jun-23	17.43002
SW34.Valı	28-Jun-23	13.24667
SW34.Valı	28-Jun-23	19.29209
SW34.Valı	28-Jun-23	-13.1833
SW34.Valı	28-Jun-23	2.46
SW34.Valı	28-Jun-23	19.02778
SW34.Valı	28-Jun-23	29.60111
SW34.Valı	28-Jun-23	14.41
SW34.Valı	28-Jun-23	23.28208
SW34.Valı	28-Jun-23	2.904444
SW34.Valı	29-Jun-23	11.07111
SW34.Valı	29-Jun-23	17.12111
SW34.Valı	29-Jun-23	14.79667
SW34.Valı	29-Jun-23	8.6
SW34.Valı	29-Jun-23	3.952411
SW34.Valı	29-Jun-23	4.396696
SW34.Valı	29-Jun-23	13.22222
SW34.Valı	29-Jun-23	22.45994
SW34.Valı	29-Jun-23	-11.7589
SW34.Valı	29-Jun-23	-13.0122
SW34.Valı	30-Jun-23	-8.23703
SW34.Valı	30-Jun-23	26.00111
SW34.Valı	30-Jun-23	-5.87444
SW34.Valı	30-Jun-23	-5.97333
SW34.Valı	30-Jun-23	-18.4161
SW34.Valı	30-Jun-23	-15.59

SW34.Valı	30-Jun-23	-12.5133
SW34.Valı	30-Jun-23	-22.6456
SW34.Valı	30-Jun-23	-16.3122
SW34.Valı	01-Jul-23	-13.7557
SW34.Valı	01-Jul-23	-15.5789
SW34.Valı	01-Jul-23	-12.1011
SW34.Valı	01-Jul-23	-16.8156
SW34.Valı	01-Jul-23	-12.1656
SW34.Valı	01-Jul-23	-2.13444
SW34.Valı	01-Jul-23	-3.59
SW34.Valı	01-Jul-23	-5.59
SW34.Valı	01-Jul-23	-6.73761
SW34.Valı	01-Jul-23	-11.3522
SW34.Valı	02-Jul-23	-8.97598
SW34.Valı	02-Jul-23	-11.5033
SW34.Valı	02-Jul-23	-8.67111
SW34.Valı	02-Jul-23	-5.59
SW34.Valı	02-Jul-23	-6.29968
SW34.Valı	02-Jul-23	1.441008
SW34.Valı	02-Jul-23	-5.48111
SW34.Valı	02-Jul-23	-9.34333
SW34.Valı	02-Jul-23	-7.07276
SW34.Valı	02-Jul-23	-8.46014
SW34.Valı	03-Jul-23	22.035
SW34.Valı	03-Jul-23	24.09368
SW34.Valı	03-Jul-23	23.49333
SW34.Valı	03-Jul-23	22.33444
SW34.Valı	03-Jul-23	-23.0122
SW34.Valı	03-Jul-23	-38.4977
SW34.Valı	03-Jul-23	4.863333
SW34.Valı	03-Jul-23	-21.59
SW34.Valı	03-Jul-23	-24.6289
SW34.Valı	03-Jul-23	-0.59333
SW34.Valı	04-Jul-23	-28.7276
SW34.Valı	04-Jul-23	15.37656
SW34.Valı	04-Jul-23	18.39331
SW34.Valı	04-Jul-23	-12.8633
SW34.Valı	04-Jul-23	12.30444
SW34.Valı	04-Jul-23	17.41
SW34.Valı	04-Jul-23	13.41
SW34.Valı	04-Jul-23	13.41
SW34.Valı	04-Jul-23	17.41
SW34.Valı	04-Jul-23	21.41
SW34.Valı	05-Jul-23	19.90501
SW34.Valı	05-Jul-23	25.41
SW34.Valı	05-Jul-23	26.41
SW34.Valı	05-Jul-23	31.23333
SW34.Valı	05-Jul-23	31.52556
SW34.Valı	05-Jul-23	27.97309
SW34.Valı	05-Jul-23	12.45889
SW34.Valı	05-Jul-23	17.41
SW34.Valı	05-Jul-23	16.15611
SW34.Valı	05-Jul-23	18.73183

SW34.Valı	06-Jul-23	16.41
SW34.Valı	06-Jul-23	19.02333
SW34.Valı	06-Jul-23	16.41
SW34.Valı	06-Jul-23	19.25
SW34.Valı	06-Jul-23	6.068333
SW34.Valı	06-Jul-23	2.782222
SW34.Valı	06-Jul-23	5.845897
SW34.Valı	06-Jul-23	11.50444
SW34.Valı	06-Jul-23	15.23879
SW34.Valı	06-Jul-23	15.41
SW34.Valı	07-Jul-23	1.297653
SW34.Valı	07-Jul-23	1.438953
SW34.Valı	07-Jul-23	-2.7084
SW34.Valı	07-Jul-23	4.915017
SW34.Valı	07-Jul-23	1.320714
SW34.Valı	07-Jul-23	6.489734
SW34.Valı	07-Jul-23	0.922792
SW34.Valı	07-Jul-23	-1.59
SW34.Valı	07-Jul-23	-2.41314
SW34.Valı	08-Jul-23	-5.69211
SW34.Valı	08-Jul-23	-7.32614
SW34.Valı	08-Jul-23	-6.85889
SW34.Valı	08-Jul-23	-5.59
SW34.Valı	08-Jul-23	-3.59
SW34.Valı	08-Jul-23	-4.59
SW34.Valı	08-Jul-23	4.21
SW34.Valı	08-Jul-23	-5.60667
SW34.Valı	08-Jul-23	-5.82307
SW34.Valı	08-Jul-23	-7.09055
SW34.Valı	09-Jul-23	-3.52778
SW34.Valı	09-Jul-23	23.37778
SW34.Valı	09-Jul-23	19.41
SW34.Valı	09-Jul-23	10.14363
SW34.Valı	09-Jul-23	-2.67389
SW34.Valı	09-Jul-23	-3.19889
SW34.Valı	09-Jul-23	-0.8746
SW34.Valı	09-Jul-23	-3.42742
SW34.Valı	09-Jul-23	-3.69667
SW34.Valı	09-Jul-23	24.41
SW34.Valı	10-Jul-23	24.41
SW34.Valı	10-Jul-23	25.41
SW34.Valı	10-Jul-23	25.48333
SW34.Valı	10-Jul-23	24.18111
SW34.Valı	10-Jul-23	23.90499
SW34.Valı	10-Jul-23	23.69667
SW34.Valı	10-Jul-23	17.38222
SW34.Valı	10-Jul-23	21.11556
SW34.Valı	10-Jul-23	21.81078
SW34.Valı	10-Jul-23	25.41
SW34.Valı	11-Jul-23	29.035
SW34.Valı	11-Jul-23	30.05
SW34.Valı	11-Jul-23	30.29629
SW34.Valı	11-Jul-23	30.37107

SW34.Valı	11-Jul-23	32.01
SW34.Valı	11-Jul-23	26.70778
SW34.Valı	11-Jul-23	22.33564
SW34.Valı	11-Jul-23	25.45111
SW34.Valı	11-Jul-23	25.63556
SW34.Valı	11-Jul-23	29.39222
SW34.Valı	12-Jul-23	29.65249
SW34.Valı	12-Jul-23	30.43442
SW34.Valı	12-Jul-23	31.11968
SW34.Valı	12-Jul-23	33.41
SW34.Valı	12-Jul-23	31.23392
SW34.Valı	12-Jul-23	28.14
SW34.Valı	12-Jul-23	26.69746
SW34.Valı	12-Jul-23	29.41
SW34.Valı	12-Jul-23	29.41
SW34.Valı	12-Jul-23	35.48778
SW34.Valı	13-Jul-23	34.98778
SW34.Valı	13-Jul-23	34.41
SW34.Valı	13-Jul-23	34.22778
SW34.Valı	13-Jul-23	37.85049
SW34.Valı	13-Jul-23	31.92276
SW34.Valı	13-Jul-23	26.15
SW34.Valı	13-Jul-23	29.37
SW34.Valı	13-Jul-23	30.98175
SW34.Valı	13-Jul-23	-13.9315
SW34.Valı	13-Jul-23	-39.4011
SW34.Valı	14-Jul-23	-52.6601
SW34.Valı	14-Jul-23	-35.2085
SW34.Valı	14-Jul-23	-37.7354
SW34.Valı	14-Jul-23	-25.7056
SW34.Valı	14-Jul-23	-19.31
SW34.Valı	14-Jul-23	10.91388
SW34.Valı	14-Jul-23	-72.9063
SW34.Valı	14-Jul-23	-20.14
SW34.Valı	14-Jul-23	-21.022
SW34.Valı	15-Jul-23	-50.4176
SW34.Valı	15-Jul-23	-20.8322
SW34.Valı	15-Jul-23	-30.6833
SW34.Valı	15-Jul-23	-21.7433
SW34.Valı	15-Jul-23	9.958889
SW34.Valı	15-Jul-23	-24.3322
SW34.Valı	15-Jul-23	8.572222
SW34.Valı	15-Jul-23	12.10556
SW34.Valı	15-Jul-23	16.02376
SW34.Valı	15-Jul-23	15.53098
SW34.Valı	16-Jul-23	-4.79
SW34.Valı	16-Jul-23	-30.1767
SW34.Valı	16-Jul-23	-28.55
SW34.Valı	16-Jul-23	-63.3178
SW34.Valı	16-Jul-23	-25.8342
SW34.Valı	16-Jul-23	8.41
SW34.Valı	16-Jul-23	10.41
SW34.Valı	16-Jul-23	13.39889

SW34.Valı	16-Jul-23	5.41
SW34.Valı	16-Jul-23	-10.1338
SW34.Valı	17-Jul-23	-17.64
SW34.Valı	17-Jul-23	-16.2067
SW34.Valı	17-Jul-23	-16.2474
SW34.Valı	17-Jul-23	18.19068
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SW34.Valı	17-Jul-23	-4.59
SW34.Valı	17-Jul-23	0.002428
SW34.Valı	17-Jul-23	-0.91556
SW34.Valı	17-Jul-23	12.42963
SW34.Valı	17-Jul-23	15.61755
SW34.Valı	18-Jul-23	16.93556
SW34.Valı	18-Jul-23	15.67
SW34.Valı	18-Jul-23	16.41
SW34.Valı	18-Jul-23	17.41
SW34.Valı	18-Jul-23	13.49
SW34.Valı	18-Jul-23	11.99333
SW34.Valı	18-Jul-23	6.626667
SW34.Valı	18-Jul-23	11.07222
SW34.Valı	18-Jul-23	12.41
SW34.Valı	18-Jul-23	12.28111
SW34.Valı	19-Jul-23	12.27222
SW34.Valı	19-Jul-23	10.81444
SW34.Valı	19-Jul-23	14.42
SW34.Valı	19-Jul-23	14.34667
SW34.Valı	19-Jul-23	7.816215
SW34.Valı	19-Jul-23	-12.59
SW34.Valı	19-Jul-23	-11.1767
SW34.Valı	19-Jul-23	-11.59
SW34.Valı	19-Jul-23	-14.0522
SW34.Valı	19-Jul-23	25.41
SW34.Valı	20-Jul-23	29.41
SW34.Valı	20-Jul-23	29.4777
SW34.Valı	20-Jul-23	29.41
SW34.Valı	20-Jul-23	0.415556
SW34.Valı	20-Jul-23	0.279565
SW34.Valı	20-Jul-23	-7.05667
SW34.Valı	20-Jul-23	-5.39133
SW34.Valı	20-Jul-23	-1.59
SW34.Valı	20-Jul-23	-5.59
SW34.Valı	20-Jul-23	-7.59
SW34.Valı	21-Jul-23	-1.98333
SW34.Valı	21-Jul-23	-5.05222
SW34.Valı	21-Jul-23	-8.59
SW34.Valı	21-Jul-23	-4.12215
SW34.Valı	21-Jul-23	-8.59
SW34.Valı	21-Jul-23	-4.6078
SW34.Valı	21-Jul-23	-9.97
SW34.Valı	21-Jul-23	-5.59
SW34.Valı	21-Jul-23	-1.59
SW34.Valı	22-Jul-23	-6.72778
SW34.Valı	22-Jul-23	-9.36333

SW34.Valı	22-Jul-23	-13.1722
SW34.Valı	22-Jul-23	-12.9137
SW34.Valı	22-Jul-23	-9.68994
SW34.Valı	22-Jul-23	-68.59
SW34.Valı	22-Jul-23	-17.7362
SW34.Valı	22-Jul-23	-47.6
SW34.Valı	22-Jul-23	-33.5434
SW34.Valı	22-Jul-23	-34.2898
SW34.Valı	23-Jul-23	-35.6967
SW34.Valı	23-Jul-23	-28.2133
SW34.Valı	23-Jul-23	-24.6499
SW34.Valı	23-Jul-23	-15.2456
SW34.Valı	23-Jul-23	-10.25
SW34.Valı	23-Jul-23	-28.466
SW34.Valı	23-Jul-23	-27.3411
SW34.Valı	23-Jul-23	-26.7613
SW34.Valı	23-Jul-23	-75.8493
SW34.Valı	23-Jul-23	-1.36076
SW34.Valı	24-Jul-23	-3.83
SW34.Valı	24-Jul-23	-2.41343
SW34.Valı	24-Jul-23	-3.86181
SW34.Valı	24-Jul-23	-0.61002
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SW34.Valı	24-Jul-23	-4.74462
SW34.Valı	24-Jul-23	-4.92445
SW34.Valı	24-Jul-23	-1.23222
SW34.Valı	24-Jul-23	-7.76556
SW34.Valı	25-Jul-23	-16.1929
SW34.Valı	25-Jul-23	-62.6178
SW34.Valı	25-Jul-23	-48.27
SW34.Valı	25-Jul-23	-36.1367
SW34.Valı	25-Jul-23	-14.55
SW34.Valı	25-Jul-23	-20.2189
SW34.Valı	25-Jul-23	-23.2288
SW34.Valı	25-Jul-23	-34.18
SW34.Valı	25-Jul-23	-59.5033
SW34.Valı	25-Jul-23	-36.8189
SW34.Valı	26-Jul-23	205.5956
SW34.Valı	26-Jul-23	-38.4587
SW34.Valı	26-Jul-23	-45.2389
SW34.Valı	26-Jul-23	-46.5256
SW34.Valı	26-Jul-23	-29.9233
SW34.Valı	26-Jul-23	-8.36487
SW34.Valı	26-Jul-23	-3.17333
SW34.Valı	26-Jul-23	-17.2078
SW34.Valı	26-Jul-23	-22.6745
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SW34.Valı	27-Jul-23	-6.23
SW34.Valı	27-Jul-23	-48.1867
SW34.Valı	27-Jul-23	-58.3037
SW34.Valı	27-Jul-23	-19.4211
SW34.Valı	27-Jul-23	-12.6916

SW34.Valı	27-Jul-23	-0.64562
SW34.Valı	27-Jul-23	-5.25
SW34.Valı	27-Jul-23	-13.31
SW34.Valı	27-Jul-23	-26.6666
SW34.Valı	27-Jul-23	-16.1682
SW34.Valı	28-Jul-23	-17.59
SW34.Valı	28-Jul-23	-14.6274
SW34.Valı	28-Jul-23	-4.50657
SW34.Valı	28-Jul-23	-16.8789
SW34.Valı	28-Jul-23	-8.68
SW34.Valı	28-Jul-23	-29.9492
SW34.Valı	28-Jul-23	-12.4767
SW34.Valı	28-Jul-23	-14.72
SW34.Valı	28-Jul-23	-30.8
SW34.Valı	28-Jul-23	-27.2559
SW34.Valı	29-Jul-23	-47.6256
SW34.Valı	29-Jul-23	-49.0189
SW34.Valı	29-Jul-23	1.494351
SW34.Valı	29-Jul-23	7.41
SW34.Valı	29-Jul-23	-7.47248
SW34.Valı	29-Jul-23	-27.2722
SW34.Valı	29-Jul-23	-29.3744
SW34.Valı	29-Jul-23	-9.34
SW34.Valı	29-Jul-23	-47.2308
SW34.Valı	30-Jul-23	-51.4969
SW34.Valı	30-Jul-23	-42.4033
SW34.Valı	30-Jul-23	-27.7678
SW34.Valı	30-Jul-23	-49.0011
SW34.Valı	30-Jul-23	-26.2268
SW34.Valı	30-Jul-23	-36.6746
SW34.Valı	30-Jul-23	-39.065
SW34.Valı	30-Jul-23	-43.8189
SW34.Valı	30-Jul-23	-52.5144
SW34.Valı	30-Jul-23	-45.2856
SW34.Valı	31-Jul-23	-48.72
SW34.Valı	31-Jul-23	-48.9167
SW34.Valı	31-Jul-23	-14.7187
SW34.Valı	31-Jul-23	-45.11
SW34.Valı	31-Jul-23	-31.5275
SW34.Valı	31-Jul-23	-6.90556
SW34.Valı	31-Jul-23	1.438761
SW34.Valı	31-Jul-23	-33.752
SW34.Valı	31-Jul-23	-0.37222
SW34.Valı	31-Jul-23	5.313333
SW34.Valı	01-Aug-23	4.175625
SW34.Valı	01-Aug-23	3.911111
SW34.Valı	01-Aug-23	2.576667
SW34.Valı	01-Aug-23	7.376555
SW34.Valı	01-Aug-23	8.512336
SW34.Valı	01-Aug-23	3.276667
SW34.Valı	01-Aug-23	5.738889
SW34.Valı	01-Aug-23	5.904444
SW34.Valı	01-Aug-23	5.141111

SW34.Vali	01-Aug-23	3.778889
SW34.Vali	02-Aug-23	3.308117
SW34.Vali	02-Aug-23	3.41
SW34.Vali	02-Aug-23	-36.1595
SW34.Vali	02-Aug-23	255.0974
SW34.Vali	02-Aug-23	2.54
SW34.Vali	02-Aug-23	112.4333
SW34.Vali	02-Aug-23	57.90667
SW34.Vali	02-Aug-23	50.93444
SW34.Vali	02-Aug-23	43.49657
SW34.Vali	02-Aug-23	29.70539
SW34.Vali	03-Aug-23	21.72333
SW34.Vali	03-Aug-23	14.75444
SW34.Vali	03-Aug-23	-2.81038
SW34.Vali	03-Aug-23	-17.8696
SW34.Vali	03-Aug-23	-21.3358
SW34.Vali	03-Aug-23	-33.6833
SW34.Vali	03-Aug-23	-48.07
SW34.Vali	03-Aug-23	-57.8833
SW34.Vali	03-Aug-23	-9.89701
SW34.Vali	03-Aug-23	-13.59
SW34.Vali	04-Aug-23	-8.47157
SW34.Vali	04-Aug-23	-2.7938
SW34.Vali	04-Aug-23	3.927778
SW34.Vali	04-Aug-23	-3.68778
SW34.Vali	04-Aug-23	-7.17158
SW34.Vali	04-Aug-23	-6.28333
SW34.Vali	04-Aug-23	-9.11941
SW34.Vali	04-Aug-23	-19.59
SW34.Vali	04-Aug-23	-51.0467
SW34.Vali	04-Aug-23	-13.4768
SW34.Vali	05-Aug-23	-23.59
SW34.Vali	05-Aug-23	-16.4339
SW34.Vali	05-Aug-23	-13.59
SW34.Vali	05-Aug-23	-12.1456
SW34.Vali	05-Aug-23	-16.5878
SW34.Vali	05-Aug-23	-12.59
SW34.Vali	05-Aug-23	-15.0005
SW34.Vali	05-Aug-23	-15.59
SW34.Vali	05-Aug-23	-15.61
SW34.Vali	06-Aug-23	-16.8767
SW34.Vali	06-Aug-23	-12.1433
SW34.Vali	06-Aug-23	-12.59
SW34.Vali	06-Aug-23	-10.8467
SW34.Vali	06-Aug-23	-9.35111
SW34.Vali	06-Aug-23	-20.2122
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SW34.Vali	06-Aug-23	-14.9678
SW34.Vali	06-Aug-23	-47.5852
SW34.Vali	07-Aug-23	-16.59
SW34.Vali	07-Aug-23	-13.59
SW34.Vali	07-Aug-23	-14.5233

SW34.Valı	07-Aug-23	-15.34
SW34.Valı	07-Aug-23	-9.69901
SW34.Valı	07-Aug-23	-26.3144
SW34.Valı	07-Aug-23	-56.8127
SW34.Valı	07-Aug-23	-39.9678
SW34.Valı	07-Aug-23	-60.9956
SW34.Valı	07-Aug-23	-13.8078
SW34.Valı	08-Aug-23	-72.6867
SW34.Valı	08-Aug-23	-54.0022
SW34.Valı	08-Aug-23	-31.9074
SW34.Valı	08-Aug-23	-38.99
SW34.Valı	08-Aug-23	-22.59
SW34.Valı	08-Aug-23	-52.75
SW34.Valı	08-Aug-23	-8.689
SW34.Valı	08-Aug-23	-30.1533
SW34.Valı	08-Aug-23	-10.0427
SW34.Valı	08-Aug-23	-12.6679
SW34.Valı	09-Aug-23	-9.63905
SW34.Valı	09-Aug-23	-21.59
SW34.Valı	09-Aug-23	-7.26631
SW34.Valı	09-Aug-23	-19.1233
SW34.Valı	09-Aug-23	-48.8597
SW34.Valı	09-Aug-23	-63.3709
SW34.Valı	09-Aug-23	-34.48
SW34.Valı	09-Aug-23	-28.0211
SW34.Valı	09-Aug-23	-1.63444
SW34.Valı	09-Aug-23	-3.61442
SW34.Valı	10-Aug-23	-9.64778
SW34.Valı	10-Aug-23	-12.758
SW34.Valı	10-Aug-23	-10.0133
SW34.Valı	10-Aug-23	-13.6256
SW34.Valı	10-Aug-23	-61.3178
SW34.Valı	10-Aug-23	-22.9418
SW34.Valı	10-Aug-23	-25.59
SW34.Valı	10-Aug-23	-30.5034
SW34.Valı	10-Aug-23	-39.1867
SW34.Valı	10-Aug-23	-1.25073
SW34.Valı	11-Aug-23	-5.37484
SW34.Valı	11-Aug-23	-10.9511
SW34.Valı	11-Aug-23	-11.59
SW34.Valı	11-Aug-23	-10.4567
SW34.Valı	11-Aug-23	-15.9544
SW34.Valı	11-Aug-23	-15.0878
SW34.Valı	11-Aug-23	-26.3864
SW34.Valı	11-Aug-23	7.292353
SW34.Valı	11-Aug-23	-5.53833
SW34.Valı	11-Aug-23	3.41
SW34.Valı	12-Aug-23	3.758502
SW34.Valı	12-Aug-23	3.677778
SW34.Valı	12-Aug-23	4.426667
SW34.Valı	12-Aug-23	-8.8339
SW34.Valı	12-Aug-23	-11.2381
SW34.Valı	12-Aug-23	-12.18

SW34.Valı	12-Aug-23	-2.19145
SW34.Valı	12-Aug-23	5.275705
SW34.Valı	12-Aug-23	3.41
SW34.Valı	13-Aug-23	3.076296
SW34.Valı	13-Aug-23	-35.1947
SW34.Valı	13-Aug-23	4.010444
SW34.Valı	13-Aug-23	9.274294
SW34.Valı	13-Aug-23	-6.15889
SW34.Valı	13-Aug-23	5.41222
SW34.Valı	13-Aug-23	12.67474
SW34.Valı	13-Aug-23	12.94111
SW34.Valı	13-Aug-23	-0.57776
SW34.Valı	13-Aug-23	-3.84305
SW34.Valı	14-Aug-23	-5.25963
SW34.Valı	14-Aug-23	-2.99333
SW34.Valı	14-Aug-23	-4.90667
SW34.Valı	14-Aug-23	-31.63
SW34.Valı	14-Aug-23	2.873333
SW34.Valı	14-Aug-23	-22.2389
SW34.Valı	14-Aug-23	-17.6478
SW34.Valı	14-Aug-23	-54.5056
SW34.Valı	14-Aug-23	-0.0535
SW34.Valı	14-Aug-23	4.96
SW34.Valı	15-Aug-23	2.243333
SW34.Valı	15-Aug-23	-23.5034
SW34.Valı	15-Aug-23	-24.6444
SW34.Valı	15-Aug-23	-19.59
SW34.Valı	15-Aug-23	-5.79
SW34.Valı	15-Aug-23	-33.7379
SW34.Valı	15-Aug-23	-12.4671
SW34.Valı	15-Aug-23	-70.5167
SW34.Valı	15-Aug-23	9.773333
SW34.Valı	15-Aug-23	16.41
SW34.Valı	16-Aug-23	12.75222
SW34.Valı	16-Aug-23	-1.66556
SW34.Valı	16-Aug-23	-1.39979
SW34.Valı	16-Aug-23	-21.9767
SW34.Valı	16-Aug-23	-6.69345
SW34.Valı	16-Aug-23	-17.62
SW34.Valı	16-Aug-23	-3.69667
SW34.Valı	16-Aug-23	-17.6355
SW34.Valı	16-Aug-23	-16.59
SW34.Valı	16-Aug-23	-57.9904
SW34.Valı	17-Aug-23	11.05895
SW34.Valı	17-Aug-23	-0.82667
SW34.Valı	17-Aug-23	6.823984
SW34.Valı	17-Aug-23	8.714444
SW34.Valı	17-Aug-23	-9.65452
SW34.Valı	17-Aug-23	-0.97667
SW34.Valı	17-Aug-23	4.249822
SW34.Valı	17-Aug-23	-4.65667
SW34.Valı	17-Aug-23	-23.4944
SW34.Valı	17-Aug-23	-21.5578

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SW34.Valı	18-Aug-23	-5.60112
SW34.Valı	18-Aug-23	-16.1078
SW34.Valı	18-Aug-23	-13.0211
SW34.Valı	18-Aug-23	-5.66333
SW34.Valı	18-Aug-23	-3.22333
SW34.Valı	18-Aug-23	2.243333
SW34.Valı	18-Aug-23	-17.89
SW34.Valı	18-Aug-23	-30.9773
SW34.Valı	18-Aug-23	-19.59
SW34.Valı	19-Aug-23	-31.9419
SW34.Valı	19-Aug-23	-15.7609
SW34.Valı	19-Aug-23	-15.59
SW34.Valı	19-Aug-23	-11.3511
SW34.Valı	19-Aug-23	-21.7333
SW34.Valı	19-Aug-23	-9.84971
SW34.Valı	19-Aug-23	-7.34333
SW34.Valı	19-Aug-23	-2.07667
SW34.Valı	19-Aug-23	-10.81
SW34.Valı	19-Aug-23	-16.1705
SW34.Valı	20-Aug-23	-1.05833
SW34.Valı	20-Aug-23	-4.74778
SW34.Valı	20-Aug-23	-12.6
SW34.Valı	20-Aug-23	-16.9233
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SW34.Valı	20-Aug-23	0.324158
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SW34.Valı	20-Aug-23	1.41
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SW34.Valı	21-Aug-23	-2.71209
SW34.Valı	21-Aug-23	-9.61775
SW34.Valı	21-Aug-23	-13.0995
SW34.Valı	21-Aug-23	-2.81444
SW34.Valı	21-Aug-23	-3.46333
SW34.Valı	21-Aug-23	-0.51564
SW34.Valı	21-Aug-23	-0.44111
SW34.Valı	21-Aug-23	-2.27222
SW34.Valı	21-Aug-23	-1.59
SW34.Valı	22-Aug-23	-1.96444
SW34.Valı	22-Aug-23	-10.95
SW34.Valı	22-Aug-23	-16.59
SW34.Valı	22-Aug-23	-18.4176
SW34.Valı	22-Aug-23	-1.74128
SW34.Valı	22-Aug-23	-1.65111
SW34.Valı	22-Aug-23	-4.73428
SW34.Valı	22-Aug-23	-4.39688
SW34.Valı	22-Aug-23	-11.0767
SW34.Valı	22-Aug-23	-13.8189
SW34.Valı	23-Aug-23	-16.5166
SW34.Valı	23-Aug-23	-15.8078
SW34.Valı	23-Aug-23	-15.59
SW34.Valı	23-Aug-23	-14.917

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SW34.Valı	23-Aug-23	-9.89855
SW34.Valı	23-Aug-23	-15.5767
SW34.Valı	23-Aug-23	-12.5489
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SW34.Valı	24-Aug-23	-24.2933
SW34.Valı	24-Aug-23	-10.59
SW34.Valı	24-Aug-23	-6.23853
SW34.Valı	24-Aug-23	-17.4567
SW34.Valı	24-Aug-23	-11.0844
SW34.Valı	24-Aug-23	-17.1549
SW34.Valı	24-Aug-23	-9.26111
SW34.Valı	24-Aug-23	-9.78556
SW34.Valı	25-Aug-23	-13.7767
SW34.Valı	25-Aug-23	-8.9593
SW34.Valı	25-Aug-23	-12.9909
SW34.Valı	25-Aug-23	-32.2374
SW34.Valı	25-Aug-23	-52.95
SW34.Valı	25-Aug-23	-25.0716
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SW34.Valı	25-Aug-23	-13.7344
SW34.Valı	25-Aug-23	-22.59
SW34.Valı	25-Aug-23	-15.1844
SW34.Valı	26-Aug-23	-19.497
SW34.Valı	26-Aug-23	-7.77715
SW34.Valı	26-Aug-23	-13.3475
SW34.Valı	26-Aug-23	-11.7622
SW34.Valı	26-Aug-23	-22.59
SW34.Valı	26-Aug-23	-38.3742
SW34.Valı	26-Aug-23	-54.4833
SW34.Valı	26-Aug-23	-22.4822
SW34.Valı	26-Aug-23	-17.59
SW34.Valı	26-Aug-23	-18.59
SW34.Valı	27-Aug-23	-13.7498
SW34.Valı	27-Aug-23	-12.59
SW34.Valı	27-Aug-23	-12.59
SW34.Valı	27-Aug-23	-21.5544
SW34.Valı	27-Aug-23	-32.0744
SW34.Valı	27-Aug-23	-19.6367
SW34.Valı	27-Aug-23	-22.2726
SW34.Valı	27-Aug-23	-20.8117
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SW34.Valı	28-Aug-23	-19.0094
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SW34.Valı	28-Aug-23	-53.499
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SW34.Valı	28-Aug-23	-28.2774
SW34.Valı	28-Aug-23	-22.6367

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SW34.Vali	29-Aug-23	-23.8492
SW34.Vali	29-Aug-23	-24.5333
SW34.Vali	29-Aug-23	-17.59
SW34.Vali	29-Aug-23	-27.59
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SW34.Vali	29-Aug-23	-59.9278
SW34.Vali	29-Aug-23	-60.1944
SW34.Vali	29-Aug-23	-31.5288
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SW34.Vali	30-Aug-23	-33.63
SW34.Vali	30-Aug-23	-27.7112
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SW34.Vali	31-Aug-23	-21.59
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SW34.Vali	31-Aug-23	-24.59
SW34.Vali	31-Aug-23	-21.1017
SW34.Vali	31-Aug-23	-55.6466
SW34.Vali	31-Aug-23	-19.1778
SW34.Vali	31-Aug-23	-72.29
SW34.Vali	31-Aug-23	-89.3678
SW34.Vali	31-Aug-23	-92.406
SW34.Vali	31-Aug-23	-80.7867
SW34.Vali	01-Sep-23	-79.3713
SW34.Vali	01-Sep-23	-21.53
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SW34.Vali	01-Sep-23	-32.7165
SW34.Vali	01-Sep-23	-54.9011
SW34.Vali	01-Sep-23	-95.075
SW34.Vali	01-Sep-23	-37.3544
SW34.Vali	01-Sep-23	-98.59
SW34.Vali	01-Sep-23	-91.59
SW34.Vali	01-Sep-23	-90.1638
SW34.Vali	02-Sep-23	-89.9615
SW34.Vali	02-Sep-23	-81.4033
SW34.Vali	02-Sep-23	-53.8125
SW34.Vali	02-Sep-23	-87.6178
SW34.Vali	02-Sep-23	-32.8535
SW34.Vali	02-Sep-23	-31.3733
SW34.Vali	02-Sep-23	-94.2515
SW34.Vali	02-Sep-23	-96.59
SW34.Vali	02-Sep-23	-40.2033
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SW34.Vali	03-Sep-23	-25.3041

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SW34.Vali	03-Sep-23	-98.1989
SW34.Vali	03-Sep-23	-101.934
SW34.Vali	03-Sep-23	-101.59
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SW34.Vali	04-Sep-23	-65.1228
SW34.Vali	04-Sep-23	-20.59
SW34.Vali	04-Sep-23	-13.5967
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SW34.Vali	05-Sep-23	-16.3286
SW34.Vali	05-Sep-23	-6.59
SW34.Vali	06-Sep-23	-17.2067
SW34.Vali	06-Sep-23	-20.651
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SW34.Vali	06-Sep-23	-20.5589
SW34.Vali	06-Sep-23	106.7478
SW34.Vali	06-Sep-23	455.3499
SW34.Vali	06-Sep-23	-29.95
SW34.Vali	06-Sep-23	-30.5166
SW34.Vali	06-Sep-23	851.41
SW34.Vali	06-Sep-23	-15.164
SW34.Vali	07-Sep-23	-19.5056
SW34.Vali	07-Sep-23	-20.8646
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SW34.Vali	07-Sep-23	851.41
SW34.Vali	07-Sep-23	668.5068
SW34.Vali	07-Sep-23	801.5421
SW34.Vali	07-Sep-23	-26.69
SW34.Vali	07-Sep-23	851.41
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SW34.Vali	08-Sep-23	93.04515
SW34.Vali	08-Sep-23	-21.59
SW34.Vali	08-Sep-23	-20.2437
SW34.Vali	08-Sep-23	-23.88
SW34.Vali	08-Sep-23	-16.91

SW34.Valı	08-Sep-23	373.0919
SW34.Valı	08-Sep-23	187.4333
SW34.Valı	08-Sep-23	851.41
SW34.Valı	08-Sep-23	-31.1122
SW34.Valı	08-Sep-23	-19.5533
SW34.Valı	09-Sep-23	-22.3753
SW34.Valı	09-Sep-23	-19.7433
SW34.Valı	09-Sep-23	-21.3709
SW34.Valı	09-Sep-23	-31.9278
SW34.Valı	09-Sep-23	-22.14
SW34.Valı	09-Sep-23	-36.59
SW34.Valı	09-Sep-23	-43.74
SW34.Valı	09-Sep-23	-39.94
SW34.Valı	09-Sep-23	-51.6611
SW34.Valı	09-Sep-23	-51.6744
SW34.Valı	10-Sep-23	-24.7279
SW34.Valı	10-Sep-23	-34.4433
SW34.Valı	10-Sep-23	-37.5428
SW34.Valı	10-Sep-23	-23.0767
SW34.Valı	10-Sep-23	-41.5558
SW34.Valı	10-Sep-23	-51.8581
SW34.Valı	10-Sep-23	-49.4589
SW34.Valı	10-Sep-23	-31.6432
SW34.Valı	10-Sep-23	-28.9074
SW34.Valı	10-Sep-23	-26.2
SW34.Valı	11-Sep-23	-31.59
SW34.Valı	11-Sep-23	-15.7456
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SW34.Valı	11-Sep-23	-26.0344
SW34.Valı	11-Sep-23	-70.1891
SW34.Valı	11-Sep-23	172.7433
SW34.Valı	11-Sep-23	851.41
SW34.Valı	11-Sep-23	-37.2252
SW34.Valı	11-Sep-23	-36.62
SW34.Valı	12-Sep-23	-89.04
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SW34.Valı	26-Oct-23	762.9211
SW34.Valı	26-Oct-23	-13.7589
SW34.Valı	26-Oct-23	-9.84778
SW34.Valı	26-Oct-23	-6.18579
SW34.Valı	26-Oct-23	-1.65667
SW34.Valı	26-Oct-23	-3.35556

SW34.Valı	26-Oct-23	-3.58889
SW34.Valı	27-Oct-23	-0.59
SW34.Valı	27-Oct-23	0.543333
SW34.Valı	27-Oct-23	5.596047
SW34.Valı	27-Oct-23	-0.63449
SW34.Valı	27-Oct-23	-34.0717
SW34.Valı	27-Oct-23	-28.4144
SW34.Valı	27-Oct-23	-14.2256
SW34.Valı	27-Oct-23	1.147778
SW34.Valı	27-Oct-23	0.307778
SW34.Valı	27-Oct-23	1.664303
SW34.Valı	28-Oct-23	6.84
SW34.Valı	28-Oct-23	-3.46667
SW34.Valı	28-Oct-23	-10.4011
SW34.Valı	28-Oct-23	2.494444
SW34.Valı	28-Oct-23	-18.9248
SW34.Valı	28-Oct-23	-36.499
SW34.Valı	28-Oct-23	-5.64556
SW34.Valı	28-Oct-23	-27.0567
SW34.Valı	28-Oct-23	2.848889
SW34.Valı	28-Oct-23	2.582414
SW34.Valı	29-Oct-23	1.41
SW34.Valı	29-Oct-23	-19.95
SW34.Valı	29-Oct-23	8.53
SW34.Valı	29-Oct-23	-7.59
SW34.Valı	29-Oct-23	-16.8013
SW34.Valı	29-Oct-23	-7.01492
SW34.Valı	29-Oct-23	-3.82111
SW34.Valı	29-Oct-23	0.157508
SW34.Valı	29-Oct-23	-13.7944
SW34.Valı	29-Oct-23	-0.60887
SW34.Valı	30-Oct-23	11.16751
SW34.Valı	30-Oct-23	8.479922
SW34.Valı	30-Oct-23	4.568713
SW34.Valı	30-Oct-23	-4.47889
SW34.Valı	30-Oct-23	-25.8122
SW34.Valı	30-Oct-23	-20.6789
SW34.Valı	30-Oct-23	-3.87889
SW34.Valı	30-Oct-23	-5.96889
SW34.Valı	30-Oct-23	-5.91075
SW34.Valı	30-Oct-23	-15.0689
SW34.Valı	31-Oct-23	-59.0633
SW34.Valı	31-Oct-23	-21.5967
SW34.Valı	31-Oct-23	-1.40333
SW34.Valı	31-Oct-23	-48.2474
SW34.Valı	31-Oct-23	-27.4742
SW34.Valı	31-Oct-23	-48.59
SW34.Valı	31-Oct-23	1.164444
SW34.Valı	31-Oct-23	-4.44523
SW34.Valı	31-Oct-23	-34.51
SW34.Valı	31-Oct-23	-54.5811
SW34.Valı	01-Nov-23	-49.6744
SW34.Valı	01-Nov-23	-40.59

SW34.Valı	01-Nov-23	-6.74
SW34.Valı	01-Nov-23	-23.174
SW34.Valı	01-Nov-23	-45.74
SW34.Valı	01-Nov-23	6.332222
SW34.Valı	01-Nov-23	8.821111
SW34.Valı	01-Nov-23	-1.38111
SW34.Valı	01-Nov-23	0.981587
SW34.Valı	02-Nov-23	-8.99556
SW34.Valı	02-Nov-23	-7.07667
SW34.Valı	02-Nov-23	-0.59
SW34.Valı	02-Nov-23	-36.55
SW34.Valı	02-Nov-23	-39.3633
SW34.Valı	02-Nov-23	-81.4433
SW34.Valı	02-Nov-23	-6.66889
SW34.Valı	02-Nov-23	-9.59
SW34.Valı	02-Nov-23	-111.263
SW34.Valı	02-Nov-23	-57.7789
SW34.Valı	03-Nov-23	-33.4678
SW34.Valı	03-Nov-23	851.41
SW34.Valı	03-Nov-23	3.763333
SW34.Valı	03-Nov-23	0.693648
SW34.Valı	03-Nov-23	-55.495
SW34.Valı	03-Nov-23	178.6274
SW34.Valı	03-Nov-23	120.5744
SW34.Valı	03-Nov-23	-144.581
SW34.Valı	03-Nov-23	-50.8167
SW34.Valı	03-Nov-23	-30.7544
SW34.Valı	04-Nov-23	-28.59
SW34.Valı	04-Nov-23	-24.5156
SW34.Valı	04-Nov-23	-30.9092
SW34.Valı	04-Nov-23	-28.0167
SW34.Valı	04-Nov-23	-18.0869
SW34.Valı	04-Nov-23	-5.33408
SW34.Valı	04-Nov-23	-6.59
SW34.Valı	04-Nov-23	-8.91778
SW34.Valı	04-Nov-23	-0.59
SW34.Valı	04-Nov-23	5.001111
SW34.Valı	05-Nov-23	-0.06111
SW34.Valı	05-Nov-23	-44.8522
SW34.Valı	05-Nov-23	-195.127
SW34.Valı	05-Nov-23	612.1019
SW34.Valı	05-Nov-23	-32.9067
SW34.Valı	05-Nov-23	-5.77
SW34.Valı	05-Nov-23	-15.1411
SW34.Valı	05-Nov-23	-13.0322
SW34.Valı	05-Nov-23	-54.7931
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SW34.Valı	06-Nov-23	-27.59
SW34.Valı	06-Nov-23	-26.59
SW34.Valı	06-Nov-23	-59.6556
SW34.Valı	06-Nov-23	-36.39
SW34.Valı	06-Nov-23	-42.7951

SW34.Valı	06-Nov-23	-33.0544
SW34.Valı	06-Nov-23	-37.5856
SW34.Valı	06-Nov-23	-35.8556
SW34.Valı	06-Nov-23	-35.1206
SW34.Valı	07-Nov-23	-32.59
SW34.Valı	07-Nov-23	-31.907
SW34.Valı	07-Nov-23	-41.61
SW34.Valı	07-Nov-23	-46.974
SW34.Valı	07-Nov-23	-16.2233
SW34.Valı	07-Nov-23	-12.2016
SW34.Valı	07-Nov-23	-18.2926
SW34.Valı	07-Nov-23	3.072222
SW34.Valı	07-Nov-23	6.48119
SW34.Valı	07-Nov-23	7.41
SW34.Valı	08-Nov-23	-47.2504
SW34.Valı	08-Nov-23	-15.6789
SW34.Valı	08-Nov-23	-39.5767
SW34.Valı	08-Nov-23	-13.55
SW34.Valı	08-Nov-23	-36.7468
SW34.Valı	08-Nov-23	-44.1417
SW34.Valı	08-Nov-23	-50.2956
SW34.Valı	08-Nov-23	-46.9396
SW34.Valı	08-Nov-23	-45.9984
SW34.Valı	09-Nov-23	-44.7322
SW34.Valı	09-Nov-23	-34.3411
SW34.Valı	09-Nov-23	-20.59
SW34.Valı	09-Nov-23	-16.6167
SW34.Valı	09-Nov-23	-22.5867
SW34.Valı	09-Nov-23	-21.1829
SW34.Valı	09-Nov-23	-6.84928
SW34.Valı	09-Nov-23	-7.5615
SW34.Valı	09-Nov-23	-8.27371
SW34.Valı	09-Nov-23	-8.98593
SW34.Valı	10-Nov-23	-9.69815
SW34.Valı	10-Nov-23	-10.4104
SW34.Valı	10-Nov-23	-11.1226
SW34.Valı	10-Nov-23	-11.8348
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SW34.Valı	10-Nov-23	-13.2592
SW34.Valı	10-Nov-23	-13.9715
SW34.Valı	10-Nov-23	-14.6837
SW34.Valı	10-Nov-23	-15.3959
SW34.Valı	10-Nov-23	-16.1081
SW34.Valı	11-Nov-23	-16.8203
SW34.Valı	11-Nov-23	-17.5326
SW34.Valı	11-Nov-23	-18.2448
SW34.Valı	11-Nov-23	-18.957
SW34.Valı	11-Nov-23	-19.6692
SW34.Valı	11-Nov-23	-20.3814
SW34.Valı	11-Nov-23	-21.0937
SW34.Valı	11-Nov-23	-21.8059
SW34.Valı	11-Nov-23	-22.5181
SW34.Valı	11-Nov-23	-23.2303

SW34.Valı	12-Nov-23	-23.9425
SW34.Valı	12-Nov-23	-24.6547
SW34.Valı	12-Nov-23	-25.367
SW34.Valı	12-Nov-23	-26.0792
SW34.Valı	12-Nov-23	-26.7914
SW34.Valı	12-Nov-23	-27.5036
SW34.Valı	12-Nov-23	-28.2158
SW34.Valı	12-Nov-23	-28.9281
SW34.Valı	12-Nov-23	-29.6403
SW34.Valı	12-Nov-23	-30.3525
SW34.Valı	13-Nov-23	-31.0647
SW34.Valı	13-Nov-23	-31.7769
SW34.Valı	13-Nov-23	-32.4892
SW34.Valı	13-Nov-23	-33.2014
SW34.Valı	13-Nov-23	-26.3122
SW34.Valı	13-Nov-23	-5.74667
SW34.Valı	13-Nov-23	-9.48
SW34.Valı	13-Nov-23	-6.21333
SW34.Valı	13-Nov-23	-5.87667
SW34.Valı	13-Nov-23	-4.59
SW34.Valı	14-Nov-23	0.584638
SW34.Valı	14-Nov-23	-9.03173
SW34.Valı	14-Nov-23	-11.1744
SW34.Valı	14-Nov-23	-16.59
SW34.Valı	14-Nov-23	-7.15
SW34.Valı	14-Nov-23	-9.09721
SW34.Valı	14-Nov-23	-5.59
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SW34.Valı	15-Nov-23	-5.75111
SW34.Valı	15-Nov-23	-11.6954
SW34.Valı	15-Nov-23	-39.6211
SW34.Valı	15-Nov-23	-39.8256
SW34.Valı	15-Nov-23	7.212222
SW34.Valı	15-Nov-23	-45.7456
SW34.Valı	15-Nov-23	-50.59
SW34.Valı	15-Nov-23	-42.1833
SW34.Valı	15-Nov-23	-5.85
SW34.Valı	16-Nov-23	-11.8264
SW34.Valı	16-Nov-23	-14.59
SW34.Valı	16-Nov-23	-11.8967
SW34.Valı	16-Nov-23	-31.3056
SW34.Valı	16-Nov-23	-15.9367
SW34.Valı	16-Nov-23	-11.48
SW34.Valı	16-Nov-23	-17.7622
SW34.Valı	16-Nov-23	-20.2867
SW34.Valı	16-Nov-23	-41.59
SW34.Valı	16-Nov-23	-12.29
SW34.Valı	17-Nov-23	-11.89
SW34.Valı	17-Nov-23	-16.4233
SW34.Valı	17-Nov-23	-21.4544
SW34.Valı	17-Nov-23	-16.8689

SW34.Valı	17-Nov-23	-26.2111
SW34.Valı	17-Nov-23	-13.9013
SW34.Valı	17-Nov-23	-9.58556
SW34.Valı	17-Nov-23	-7.06111
SW34.Valı	17-Nov-23	-13.5411
SW34.Valı	17-Nov-23	-24.59
SW34.Valı	18-Nov-23	-36.765
SW34.Valı	18-Nov-23	-23.42
SW34.Valı	18-Nov-23	9.41
SW34.Valı	18-Nov-23	-0.22778
SW34.Valı	18-Nov-23	-19.3633
SW34.Valı	18-Nov-23	1.618889
SW34.Valı	18-Nov-23	2.765556
SW34.Valı	18-Nov-23	7.837778
SW34.Valı	18-Nov-23	8.41
SW34.Valı	18-Nov-23	8.45
SW34.Valı	19-Nov-23	5.183333
SW34.Valı	19-Nov-23	4.916667
SW34.Valı	19-Nov-23	6.169156
SW34.Valı	19-Nov-23	3.41
SW34.Valı	19-Nov-23	3.702222
SW34.Valı	19-Nov-23	-0.14778
SW34.Valı	19-Nov-23	0.287778
SW34.Valı	19-Nov-23	4.41
SW34.Valı	19-Nov-23	3.41
SW34.Valı	19-Nov-23	8.41
SW34.Valı	20-Nov-23	-21.03
SW34.Valı	20-Nov-23	-32.3367
SW34.Valı	20-Nov-23	-25.4718
SW34.Valı	20-Nov-23	-23.59
SW34.Valı	20-Nov-23	-1.36778
SW34.Valı	20-Nov-23	7.631111
SW34.Valı	20-Nov-23	12.90593
SW34.Valı	20-Nov-23	0.41
SW34.Valı	20-Nov-23	4.41
SW34.Valı	20-Nov-23	-1.01
SW34.Valı	21-Nov-23	-23.1433
SW34.Valı	21-Nov-23	-24.8617
SW34.Valı	21-Nov-23	-26.59
SW34.Valı	21-Nov-23	-2.83249
SW34.Valı	21-Nov-23	-44.4467
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SW34.Valı	21-Nov-23	-28.4389
SW34.Valı	21-Nov-23	-19.59
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SW34.Valı	22-Nov-23	-23.59
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SW34.Valı	22-Nov-23	-30.5544
SW34.Valı	22-Nov-23	-25.4033
SW34.Valı	22-Nov-23	-11.8967
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SW34.Valı	23-Nov-23	-27.4435
SW34.Valı	23-Nov-23	-34.9411
SW34.Valı	23-Nov-23	-4.9958
SW34.Valı	23-Nov-23	-2.53553
SW34.Valı	23-Nov-23	-4.40667
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SW34.Valı	23-Nov-23	7.39
SW34.Valı	24-Nov-23	-25.27
SW34.Valı	24-Nov-23	1.323333
SW34.Valı	24-Nov-23	8.792222
SW34.Valı	24-Nov-23	7.485556
SW34.Valı	24-Nov-23	-2.90556
SW34.Valı	24-Nov-23	-38.2833
SW34.Valı	24-Nov-23	-6.46444
SW34.Valı	24-Nov-23	-38.2956
SW34.Valı	24-Nov-23	-22.2311
SW34.Valı	24-Nov-23	-41.9167
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SW34.Valı	25-Nov-23	-32.5567
SW34.Valı	25-Nov-23	-29.0627
SW34.Valı	25-Nov-23	-34.6344
SW34.Valı	25-Nov-23	-38.5844
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SW34.Valı	25-Nov-23	-1.12778
SW34.Valı	25-Nov-23	-36.59
SW34.Valı	25-Nov-23	-31.9456
SW34.Valı	25-Nov-23	-33.2633
SW34.Valı	26-Nov-23	-31.59
SW34.Valı	26-Nov-23	-28.46
SW34.Valı	26-Nov-23	-31.7256
SW34.Valı	26-Nov-23	-1.18643
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SW34.Valı	26-Nov-23	-34.7211
SW34.Valı	26-Nov-23	2.41
SW34.Valı	26-Nov-23	3.942222
SW34.Valı	26-Nov-23	4.675851
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SW34.Vali	29-Nov-23	-4.59
SW34.Vali	29-Nov-23	-0.50283
SW34.Vali	29-Nov-23	-1.67361
SW34.Vali	29-Nov-23	3.561111
SW34.Vali	29-Nov-23	6.645556
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SW34.Vali	29-Nov-23	4.41
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SW34.Vali	02-Dec-23	-4.14238
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SW34.Vali	03-Dec-23	-9.74816
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SW34.Valı	03-Dec-23	-13.1116
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SW34.Valı	04-Dec-23	-15.3539
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SW34.Valı	04-Dec-23	-17.0357
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SW34.Valı	04-Dec-23	-18.7174
SW34.Valı	04-Dec-23	-19.278
SW34.Valı	04-Dec-23	-19.8386
SW34.Valı	04-Dec-23	-20.3991
SW34.Valı	05-Dec-23	-20.9597
SW34.Valı	05-Dec-23	-21.5203
SW34.Valı	05-Dec-23	-22.0809
SW34.Valı	05-Dec-23	-24.3767
SW34.Valı	05-Dec-23	-32.4433
SW34.Valı	05-Dec-23	-24.67
SW34.Valı	05-Dec-23	-15.7767
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SW34.Valı	05-Dec-23	-25.3456
SW34.Valı	05-Dec-23	-32.0011
SW34.Valı	06-Dec-23	-31.5644
SW34.Valı	06-Dec-23	-21.6322
SW34.Valı	06-Dec-23	-11.6167
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SW34.Valı	06-Dec-23	-11.0667
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SW34.Valı	06-Dec-23	-6.15
SW34.Valı	06-Dec-23	4.063333
SW34.Valı	06-Dec-23	-24.8967
SW34.Valı	06-Dec-23	-34.9678
SW34.Valı	07-Dec-23	-26.1322
SW34.Valı	07-Dec-23	-20.8867
SW34.Valı	07-Dec-23	-33.08
SW34.Valı	07-Dec-23	-19.7622
SW34.Valı	07-Dec-23	-5.38333
SW34.Valı	07-Dec-23	1.313226
SW34.Valı	07-Dec-23	-7.35667
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SW34.Valı	08-Dec-23	-3.59
SW34.Valı	08-Dec-23	-5.39444
SW34.Valı	08-Dec-23	3.41
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SW34.Valı	08-Dec-23	-5.68333
SW34.Valı	08-Dec-23	-28.2389
SW34.Valı	08-Dec-23	-42.0739
SW34.Valı	08-Dec-23	0.083333

SW34.Valı	08-Dec-23	6.84
SW34.Valı	09-Dec-23	4.41
SW34.Valı	09-Dec-23	2.258889
SW34.Valı	09-Dec-23	6.181111
SW34.Valı	09-Dec-23	-9.05
SW34.Valı	09-Dec-23	-7.82889
SW34.Valı	09-Dec-23	-11.6456
SW34.Valı	09-Dec-23	-34.7122
SW34.Valı	09-Dec-23	-22.0789
SW34.Valı	09-Dec-23	-0.24333
SW34.Valı	09-Dec-23	7.41
SW34.Valı	10-Dec-23	5.77
SW34.Valı	10-Dec-23	-1.96444
SW34.Valı	10-Dec-23	-9.72778
SW34.Valı	10-Dec-23	5.251111
SW34.Valı	10-Dec-23	-23.1684
SW34.Valı	10-Dec-23	7.41
SW34.Valı	10-Dec-23	10.36778
SW34.Valı	10-Dec-23	9.633582
SW34.Valı	10-Dec-23	6.918889
SW34.Valı	10-Dec-23	4.653333
SW34.Valı	11-Dec-23	-15.1
SW34.Valı	11-Dec-23	-6.71
SW34.Valı	11-Dec-23	-5.92333
SW34.Valı	11-Dec-23	2.521111
SW34.Valı	11-Dec-23	-0.32333
SW34.Valı	11-Dec-23	5.346667
SW34.Valı	11-Dec-23	6.357222
SW34.Valı	11-Dec-23	6.41
SW34.Valı	11-Dec-23	3.41
SW34.Valı	11-Dec-23	7.83
SW34.Valı	12-Dec-23	3.41
SW34.Valı	12-Dec-23	7.456667
SW34.Valı	12-Dec-23	2.847778
SW34.Valı	12-Dec-23	0.554444
SW34.Valı	12-Dec-23	0.162222
SW34.Valı	12-Dec-23	2.937515
SW34.Valı	12-Dec-23	5.41
SW34.Valı	12-Dec-23	6.41
SW34.Valı	12-Dec-23	-33.0427
SW34.Valı	12-Dec-23	-21.2567
SW34.Valı	13-Dec-23	-17.84
SW34.Valı	13-Dec-23	6.026667
SW34.Valı	13-Dec-23	-1.94333
SW34.Valı	13-Dec-23	-3.84556
SW34.Valı	13-Dec-23	-27.07
SW34.Valı	13-Dec-23	1.047778
SW34.Valı	13-Dec-23	0.41
SW34.Valı	13-Dec-23	-2.59
SW34.Valı	13-Dec-23	-17.7967
SW34.Valı	13-Dec-23	5.143333
SW34.Valı	14-Dec-23	-1.60333
SW34.Valı	14-Dec-23	2.17

SW34.Valı	14-Dec-23	-0.04444
SW34.Valı	14-Dec-23	-6.15604
SW34.Valı	14-Dec-23	1.488889
SW34.Valı	14-Dec-23	-9.17111
SW34.Valı	14-Dec-23	-2.47889
SW34.Valı	14-Dec-23	-1.59
SW34.Valı	14-Dec-23	-55.4567
SW34.Valı	15-Dec-23	-42.2318
SW34.Valı	15-Dec-23	-31.2367
SW34.Valı	15-Dec-23	-22.23
SW34.Valı	15-Dec-23	-2.38
SW34.Valı	15-Dec-23	-9.63889
SW34.Valı	15-Dec-23	-18.1589
SW34.Valı	15-Dec-23	-9.59
SW34.Valı	15-Dec-23	-11.3144
SW34.Valı	15-Dec-23	-31.8156
SW34.Valı	15-Dec-23	-37.59
SW34.Valı	16-Dec-23	-0.88778
SW34.Valı	16-Dec-23	-3.89
SW34.Valı	16-Dec-23	4.106667
SW34.Valı	16-Dec-23	-15.3233
SW34.Valı	16-Dec-23	-17.15
SW34.Valı	16-Dec-23	-42.7511
SW34.Valı	16-Dec-23	-41.0178
SW34.Valı	16-Dec-23	10.47111
SW34.Valı	16-Dec-23	7.41
SW34.Valı	16-Dec-23	-1.59
SW34.Valı	17-Dec-23	-0.80333
SW34.Valı	17-Dec-23	3.414444
SW34.Valı	17-Dec-23	5.95485
SW34.Valı	17-Dec-23	-2.83333
SW34.Valı	17-Dec-23	-4.59
SW34.Valı	17-Dec-23	-1.63886
SW34.Valı	17-Dec-23	-2.26186
SW34.Valı	17-Dec-23	8.614444
SW34.Valı	17-Dec-23	3.901852
SW34.Valı	17-Dec-23	3.86838
SW34.Valı	18-Dec-23	0.811111
SW34.Valı	18-Dec-23	1.074444
SW34.Valı	18-Dec-23	4.01
SW34.Valı	18-Dec-23	-18.39
SW34.Valı	18-Dec-23	-8.72333
SW34.Valı	18-Dec-23	-5.72333
SW34.Valı	18-Dec-23	-3.59
SW34.Valı	18-Dec-23	-1.32444
SW34.Valı	18-Dec-23	-5.05778
SW34.Valı	18-Dec-23	1.41
SW34.Valı	19-Dec-23	2.216667
SW34.Valı	19-Dec-23	-3.59667
SW34.Valı	19-Dec-23	-2.38333
SW34.Valı	19-Dec-23	-12.8114
SW34.Valı	19-Dec-23	-8.94
SW34.Valı	19-Dec-23	0.226054

SW34.Valı	19-Dec-23	-9.2589
SW34.Valı	19-Dec-23	-6.23444
SW34.Valı	19-Dec-23	-3.17667
SW34.Valı	19-Dec-23	0.258889
SW34.Valı	20-Dec-23	-0.59
SW34.Valı	20-Dec-23	3.393333
SW34.Valı	20-Dec-23	2.626667
SW34.Valı	20-Dec-23	-24.3122
SW34.Valı	20-Dec-23	-20.5322
SW34.Valı	20-Dec-23	-48.4088
SW34.Valı	20-Dec-23	-46.59
SW34.Valı	20-Dec-23	-4.59
SW34.Valı	20-Dec-23	3.262778
SW34.Valı	20-Dec-23	2.41
SW34.Valı	21-Dec-23	3.625556
SW34.Valı	21-Dec-23	4.751842
SW34.Valı	21-Dec-23	1.41
SW34.Valı	21-Dec-23	-0.73667
SW34.Valı	21-Dec-23	-30.5368
SW34.Valı	21-Dec-23	-30.3329
SW34.Valı	21-Dec-23	-30.1291
SW34.Valı	21-Dec-23	-29.9252
SW34.Valı	21-Dec-23	-29.7214
SW34.Valı	21-Dec-23	-29.5175
SW34.Valı	22-Dec-23	-29.3137
SW34.Valı	22-Dec-23	-29.1098
SW34.Valı	22-Dec-23	-28.906
SW34.Valı	22-Dec-23	-28.7021
SW34.Valı	22-Dec-23	-28.4983
SW34.Valı	22-Dec-23	-28.2945
SW34.Valı	22-Dec-23	-28.0906
SW34.Valı	22-Dec-23	-27.8868
SW34.Valı	22-Dec-23	-27.6829
SW34.Valı	23-Dec-23	-27.4791
SW34.Valı	23-Dec-23	-27.2752
SW34.Valı	23-Dec-23	-27.0714
SW34.Valı	23-Dec-23	-26.8675
SW34.Valı	23-Dec-23	-26.6637
SW34.Valı	23-Dec-23	-26.4598
SW34.Valı	23-Dec-23	-26.256
SW34.Valı	23-Dec-23	-26.0521
SW34.Valı	23-Dec-23	-25.8483
SW34.Valı	23-Dec-23	-25.6445
SW34.Valı	24-Dec-23	-25.4406
SW34.Valı	24-Dec-23	-25.2368
SW34.Valı	24-Dec-23	-25.0329
SW34.Valı	24-Dec-23	-24.8291
SW34.Valı	24-Dec-23	-24.6252
SW34.Valı	24-Dec-23	-24.4214
SW34.Valı	24-Dec-23	-24.2175
SW34.Valı	24-Dec-23	-24.0137
SW34.Valı	24-Dec-23	-23.8098
SW34.Valı	24-Dec-23	-23.606

SW34.Valı	25-Dec-23	-23.4021
SW34.Valı	25-Dec-23	-23.1983
SW34.Valı	25-Dec-23	-22.9945
SW34.Valı	25-Dec-23	-22.7906
SW34.Valı	25-Dec-23	-22.5868
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SW34.Valı	25-Dec-23	-21.7714
SW34.Valı	25-Dec-23	-21.5675
SW34.Valı	26-Dec-23	-21.3637
SW34.Valı	26-Dec-23	-21.1598
SW34.Valı	26-Dec-23	-20.956
SW34.Valı	26-Dec-23	-20.7521
SW34.Valı	26-Dec-23	-20.5483
SW34.Valı	26-Dec-23	-20.3444
SW34.Valı	26-Dec-23	-20.1406
SW34.Valı	26-Dec-23	-19.9368
SW34.Valı	26-Dec-23	-19.7329
SW34.Valı	26-Dec-23	-19.5291
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SW34.Valı	27-Dec-23	-19.1214
SW34.Valı	27-Dec-23	-18.9175
SW34.Valı	27-Dec-23	-18.7137
SW34.Valı	27-Dec-23	-18.5098
SW34.Valı	27-Dec-23	-18.306
SW34.Valı	27-Dec-23	-18.1021
SW34.Valı	27-Dec-23	-17.8983
SW34.Valı	27-Dec-23	-17.6944
SW34.Valı	27-Dec-23	-17.4906
SW34.Valı	28-Dec-23	-17.2868
SW34.Valı	28-Dec-23	-17.0829
SW34.Valı	28-Dec-23	-16.8791
SW34.Valı	28-Dec-23	-16.6752
SW34.Valı	28-Dec-23	-16.4714
SW34.Valı	28-Dec-23	-16.2675
SW34.Valı	28-Dec-23	-16.0637
SW34.Valı	28-Dec-23	-15.8598
SW34.Valı	28-Dec-23	-15.656
SW34.Valı	28-Dec-23	-15.4521
SW34.Valı	29-Dec-23	-15.2483
SW34.Valı	29-Dec-23	-15.0444
SW34.Valı	29-Dec-23	-14.8406
SW34.Valı	29-Dec-23	-14.6368
SW34.Valı	29-Dec-23	-14.4329
SW34.Valı	29-Dec-23	-14.2291
SW34.Valı	29-Dec-23	-14.0252
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SW34.Valı	29-Dec-23	-13.6175
SW34.Valı	30-Dec-23	-13.4137
SW34.Valı	30-Dec-23	-13.2098
SW34.Valı	30-Dec-23	-13.006
SW34.Valı	30-Dec-23	-12.8021

SW34.Valı	30-Dec-23	-12.5983
SW34.Valı	30-Dec-23	-12.3944
SW34.Valı	30-Dec-23	-12.1906
SW34.Valı	30-Dec-23	-11.9868
SW34.Valı	30-Dec-23	-11.7829
SW34.Valı	30-Dec-23	-11.5791
SW34.Valı	31-Dec-23	-11.3752
SW34.Valı	31-Dec-23	-11.1714
SW34.Valı	31-Dec-23	-10.9675
SW34.Valı	31-Dec-23	-10.7637
SW34.Valı	31-Dec-23	-10.5598
SW34.Valı	31-Dec-23	-10.356
SW34.Valı	31-Dec-23	-10.1521
SW34.Valı	31-Dec-23	-9.9483
SW34.Valı	31-Dec-23	-9.74445
SW34.Valı	31-Dec-23	-9.5406
SW34.Valı	01-Jan-24	-9.33676
SW34.Valı	01-Jan-24	-9.13291
SW34.Valı	01-Jan-24	-8.92906
SW34.Valı	01-Jan-24	-8.72522
SW34.Valı	01-Jan-24	-8.52137
SW34.Valı	01-Jan-24	-8.31753
SW34.Valı	01-Jan-24	-8.11368
SW34.Valı	01-Jan-24	-7.90983
SW34.Valı	01-Jan-24	-7.70599
SW34.Valı	01-Jan-24	-7.50214
SW34.Valı	02-Jan-24	-7.2983
SW34.Valı	02-Jan-24	-7.09445
SW34.Valı	02-Jan-24	-6.8906
SW34.Valı	02-Jan-24	-6.68676
SW34.Valı	02-Jan-24	-8.02333
SW34.Valı	02-Jan-24	-4.97667
SW34.Valı	02-Jan-24	-2.33333
SW34.Valı	02-Jan-24	-1.21889
SW34.Valı	02-Jan-24	0.505556
SW34.Valı	02-Jan-24	0.627778
SW34.Valı	03-Jan-24	0.41
SW34.Valı	03-Jan-24	-2.09667
SW34.Valı	03-Jan-24	-6.53994
SW34.Valı	03-Jan-24	-8.87302
SW34.Valı	03-Jan-24	-8.0405
SW34.Valı	03-Jan-24	0.676667
SW34.Valı	03-Jan-24	-5.89973
SW34.Valı	03-Jan-24	-3.24111
SW34.Valı	03-Jan-24	-0.82111
SW34.Valı	03-Jan-24	-2.47111
SW34.Valı	04-Jan-24	-3.44222
SW34.Valı	04-Jan-24	-0.83333
SW34.Valı	04-Jan-24	-1.86556
SW34.Valı	04-Jan-24	-1.53667
SW34.Valı	04-Jan-24	-3.37667
SW34.Valı	04-Jan-24	0.97
SW34.Valı	04-Jan-24	-2.59

SW34.Valı	04-Jan-24	-2.60222
SW34.Valı	04-Jan-24	-1.86889
SW34.Valı	04-Jan-24	-2.68111
SW34.Valı	05-Jan-24	2.221321
SW34.Valı	05-Jan-24	2.254444
SW34.Valı	05-Jan-24	-7.72889
SW34.Valı	05-Jan-24	-5.36913
SW34.Valı	05-Jan-24	4.41
SW34.Valı	05-Jan-24	5.266667
SW34.Valı	05-Jan-24	-1.23
SW34.Valı	05-Jan-24	1.41
SW34.Valı	05-Jan-24	-1.64778
SW34.Valı	06-Jan-24	1.618889
SW34.Valı	06-Jan-24	-0.06556
SW34.Valı	06-Jan-24	2.186667
SW34.Valı	06-Jan-24	1.347778
SW34.Valı	06-Jan-24	-6.31636
SW34.Valı	06-Jan-24	-8.88444
SW34.Valı	06-Jan-24	0.023333
SW34.Valı	06-Jan-24	-8.22333
SW34.Valı	06-Jan-24	-2.59
SW34.Valı	06-Jan-24	1.804007
SW34.Valı	07-Jan-24	-1.20667
SW34.Valı	07-Jan-24	-9.00667
SW34.Valı	07-Jan-24	588.6656
SW34.Valı	07-Jan-24	851.41
SW34.Valı	07-Jan-24	12.09889
SW34.Valı	07-Jan-24	-40.2033
SW34.Valı	07-Jan-24	-3.23889
SW34.Valı	07-Jan-24	-1.06333
SW34.Valı	07-Jan-24	-1.58333
SW34.Valı	07-Jan-24	-0.4
SW34.Valı	08-Jan-24	-1.30556
SW34.Valı	08-Jan-24	-1.59
SW34.Valı	08-Jan-24	1.41
SW34.Valı	08-Jan-24	-0.59333
SW34.Valı	08-Jan-24	3.82
SW34.Valı	08-Jan-24	4.542222
SW34.Valı	08-Jan-24	3.342147
SW34.Valı	08-Jan-24	-4.19
SW34.Valı	08-Jan-24	2.41
SW34.Valı	08-Jan-24	-2.65667
SW34.Valı	09-Jan-24	-5.19178
SW34.Valı	09-Jan-24	-4.46889
SW34.Valı	09-Jan-24	1.677778
SW34.Valı	09-Jan-24	-5.59667
SW34.Valı	09-Jan-24	-10.1189
SW34.Valı	09-Jan-24	-2.05889
SW34.Valı	09-Jan-24	-8.77556
SW34.Valı	09-Jan-24	1.156667
SW34.Valı	09-Jan-24	5.75
SW34.Valı	09-Jan-24	4.41
SW34.Valı	10-Jan-24	5.41

SW34.Valı	10-Jan-24	6.281111
SW34.Valı	10-Jan-24	1.387778
SW34.Valı	10-Jan-24	-1.26703
SW34.Valı	10-Jan-24	-1.08444
SW34.Valı	10-Jan-24	4.41
SW34.Valı	10-Jan-24	0.026667
SW34.Valı	10-Jan-24	-0.49667
SW34.Valı	10-Jan-24	3.403333
SW34.Valı	10-Jan-24	-2.74
SW34.Valı	11-Jan-24	0.986667
SW34.Valı	11-Jan-24	0.241111
SW34.Valı	11-Jan-24	1.056667
SW34.Valı	11-Jan-24	-8.25259
SW34.Valı	11-Jan-24	-7.36333
SW34.Valı	11-Jan-24	-3.30524
SW34.Valı	11-Jan-24	7.912222
SW34.Valı	11-Jan-24	42.01889
SW34.Valı	11-Jan-24	26.5
SW34.Valı	11-Jan-24	-5.67
SW34.Valı	12-Jan-24	-3.59
SW34.Valı	12-Jan-24	-5.17333
SW34.Valı	12-Jan-24	-4.53444
SW34.Valı	12-Jan-24	-2.59
SW34.Valı	12-Jan-24	1.682222
SW34.Valı	12-Jan-24	4.068915
SW34.Valı	12-Jan-24	2.198483
SW34.Valı	12-Jan-24	0.463393
SW34.Valı	12-Jan-24	2.09
SW34.Valı	12-Jan-24	-0.35
SW34.Valı	13-Jan-24	3.825282
SW34.Valı	13-Jan-24	-4.11444
SW34.Valı	13-Jan-24	6.168889
SW34.Valı	13-Jan-24	5.061498
SW34.Valı	13-Jan-24	3.492131
SW34.Valı	13-Jan-24	7.778889
SW34.Valı	13-Jan-24	25.65889
SW34.Valı	13-Jan-24	85.71667
SW34.Valı	13-Jan-24	55.32667
SW34.Valı	14-Jan-24	41.66249
SW34.Valı	14-Jan-24	43.44333
SW34.Valı	14-Jan-24	37.84556
SW34.Valı	14-Jan-24	25.04556
SW34.Valı	14-Jan-24	14.30123
SW34.Valı	14-Jan-24	3.765556
SW34.Valı	14-Jan-24	7.714444
SW34.Valı	14-Jan-24	5.524444
SW34.Valı	14-Jan-24	8.41
SW34.Valı	14-Jan-24	4.41
SW34.Valı	15-Jan-24	6.496667
SW34.Valı	15-Jan-24	1.59
SW34.Valı	15-Jan-24	3.302342
SW34.Valı	15-Jan-24	-9.30222
SW34.Valı	15-Jan-24	-3.71667

SW34.Valı	15-Jan-24	-0.08111
SW34.Valı	15-Jan-24	-10.3802
SW34.Valı	15-Jan-24	3.41
SW34.Valı	15-Jan-24	3.81
SW34.Valı	15-Jan-24	3.41
SW34.Valı	16-Jan-24	1.833333
SW34.Valı	16-Jan-24	2.41
SW34.Valı	16-Jan-24	2.954444
SW34.Valı	16-Jan-24	3.907778
SW34.Valı	16-Jan-24	-0.37889
SW34.Valı	16-Jan-24	9.772222
SW34.Valı	16-Jan-24	12.23556
SW34.Valı	16-Jan-24	6.852586
SW34.Valı	16-Jan-24	11.70222
SW34.Valı	16-Jan-24	81.41
SW34.Valı	17-Jan-24	87.89
SW34.Valı	17-Jan-24	8.383333
SW34.Valı	17-Jan-24	5.843018
SW34.Valı	17-Jan-24	6.41
SW34.Valı	17-Jan-24	10.5813
SW34.Valı	17-Jan-24	3.982222
SW34.Valı	17-Jan-24	85.65222
SW34.Valı	17-Jan-24	78.03667
SW34.Valı	17-Jan-24	46.75556
SW34.Valı	17-Jan-24	39.86636
SW34.Valı	18-Jan-24	58.02333
SW34.Valı	18-Jan-24	41.92
SW34.Valı	18-Jan-24	44.66333
SW34.Valı	18-Jan-24	28.70778
SW34.Valı	18-Jan-24	33.55008
SW34.Valı	18-Jan-24	32.70333
SW34.Valı	18-Jan-24	29.41333
SW34.Valı	18-Jan-24	-4.15889
SW34.Valı	18-Jan-24	16.27222
SW34.Valı	18-Jan-24	18.61444
SW34.Valı	19-Jan-24	15.44333
SW34.Valı	19-Jan-24	-12.09
SW34.Valı	19-Jan-24	-1.49
SW34.Valı	19-Jan-24	5.162222
SW34.Valı	19-Jan-24	-7.03667
SW34.Valı	19-Jan-24	5.695239
SW34.Valı	19-Jan-24	6.383333
SW34.Valı	19-Jan-24	-7.91889
SW34.Valı	19-Jan-24	-15.229
SW34.Valı	19-Jan-24	-0.91
SW34.Valı	20-Jan-24	1.49
SW34.Valı	20-Jan-24	4.43
SW34.Valı	20-Jan-24	-2.82667
SW34.Valı	20-Jan-24	-19.0983
SW34.Valı	20-Jan-24	-4.29444
SW34.Valı	20-Jan-24	15.60778
SW34.Valı	20-Jan-24	-3.78778
SW34.Valı	20-Jan-24	6.126667

SW34.Valı	20-Jan-24	10.66
SW34.Valı	21-Jan-24	6.41
SW34.Valı	21-Jan-24	2.516667
SW34.Valı	21-Jan-24	1.13
SW34.Valı	21-Jan-24	-13.15
SW34.Valı	21-Jan-24	-4.59111
SW34.Valı	21-Jan-24	2.574444
SW34.Valı	21-Jan-24	-10.4844
SW34.Valı	21-Jan-24	62.23444
SW34.Valı	21-Jan-24	-0.3831
SW34.Valı	21-Jan-24	5.458889
SW34.Valı	22-Jan-24	4.536667
SW34.Valı	22-Jan-24	0.738142
SW34.Valı	22-Jan-24	28.09
SW34.Valı	22-Jan-24	-10.2415
SW34.Valı	22-Jan-24	4.191354
SW34.Valı	22-Jan-24	1.919434
SW34.Valı	22-Jan-24	-0.59
SW34.Valı	22-Jan-24	10.32111
SW34.Valı	22-Jan-24	3.321111
SW34.Valı	22-Jan-24	-1.59
SW34.Valı	23-Jan-24	2.455556
SW34.Valı	23-Jan-24	2.746667
SW34.Valı	23-Jan-24	-3.07778
SW34.Valı	23-Jan-24	-7.85
SW34.Valı	23-Jan-24	-5.69
SW34.Valı	23-Jan-24	59.76333
SW34.Valı	23-Jan-24	-3.48333
SW34.Valı	23-Jan-24	-14.07
SW34.Valı	23-Jan-24	-18.3333
SW34.Valı	23-Jan-24	1.762222
SW34.Valı	24-Jan-24	8.938889
SW34.Valı	24-Jan-24	-28.9278
SW34.Valı	24-Jan-24	-8.39534
SW34.Valı	24-Jan-24	-21.5011
SW34.Valı	24-Jan-24	-5.63894
SW34.Valı	24-Jan-24	-28.69
SW34.Valı	24-Jan-24	0.993333
SW34.Valı	24-Jan-24	-27.34
SW34.Valı	24-Jan-24	1.41
SW34.Valı	24-Jan-24	-26.5744
SW34.Valı	25-Jan-24	0.757052
SW34.Valı	25-Jan-24	-14.0489
SW34.Valı	25-Jan-24	-8.94
SW34.Valı	25-Jan-24	-13.3456
SW34.Valı	25-Jan-24	-10.2567
SW34.Valı	25-Jan-24	-20.5767
SW34.Valı	25-Jan-24	-15.75
SW34.Valı	25-Jan-24	101.9167
SW34.Valı	25-Jan-24	-28.8878
SW34.Valı	25-Jan-24	-28.3056
SW34.Valı	26-Jan-24	-15.8078
SW34.Valı	26-Jan-24	-13.956

SW34.Valı	26-Jan-24	-23.7789
SW34.Valı	26-Jan-24	-18.0344
SW34.Valı	26-Jan-24	8.076667
SW34.Valı	26-Jan-24	33.74333
SW34.Valı	26-Jan-24	-38.0756
SW34.Valı	26-Jan-24	11.35
SW34.Valı	26-Jan-24	-33.6667
SW34.Valı	26-Jan-24	-28.59
SW34.Valı	27-Jan-24	15.89
SW34.Valı	27-Jan-24	182.2856
SW34.Valı	27-Jan-24	-26.5344
SW34.Valı	27-Jan-24	-6.08388
SW34.Valı	27-Jan-24	-29.5444
SW34.Valı	27-Jan-24	-13.82
SW34.Valı	27-Jan-24	-18.93
SW34.Valı	27-Jan-24	-12.0567
SW34.Valı	27-Jan-24	32.45
SW34.Valı	28-Jan-24	-41.5956
SW34.Valı	28-Jan-24	-16.9511
SW34.Valı	28-Jan-24	-20.0511
SW34.Valı	28-Jan-24	-26.3153
SW34.Valı	28-Jan-24	22.63667
SW34.Valı	28-Jan-24	0.085556
SW34.Valı	28-Jan-24	-16.9411
SW34.Valı	28-Jan-24	103.56
SW34.Valı	28-Jan-24	77.78667
SW34.Valı	28-Jan-24	85.34667
SW34.Valı	29-Jan-24	-4.57
SW34.Valı	29-Jan-24	127.9773
SW34.Valı	29-Jan-24	71.33556
SW34.Valı	29-Jan-24	2.41
SW34.Valı	29-Jan-24	-4.2
SW34.Valı	29-Jan-24	-42.59
SW34.Valı	29-Jan-24	-44.18
SW34.Valı	29-Jan-24	-17.39
SW34.Valı	29-Jan-24	-36.79
SW34.Valı	29-Jan-24	-11.5233
SW34.Valı	30-Jan-24	25.07075
SW34.Valı	30-Jan-24	25.69111
SW34.Valı	30-Jan-24	34.03222
SW34.Valı	30-Jan-24	47.53444
SW34.Valı	30-Jan-24	52.96778
SW34.Valı	30-Jan-24	-29.9322
SW34.Valı	30-Jan-24	0.683333
SW34.Valı	30-Jan-24	30.59
SW34.Valı	30-Jan-24	146.1933
SW34.Valı	30-Jan-24	137.57
SW34.Valı	31-Jan-24	110.4167
SW34.Valı	31-Jan-24	78.70333
SW34.Valı	31-Jan-24	72.52556
SW34.Valı	31-Jan-24	87.12111
SW34.Valı	31-Jan-24	93.47111
SW34.Valı	31-Jan-24	52.04889

SW34.Valı	31-Jan-24	76.53778
SW34.Valı	31-Jan-24	52.99
SW34.Valı	31-Jan-24	42.53667
SW34.Valı	31-Jan-24	44.23
SW34.Valı	01-Feb-24	50.75111
SW34.Valı	01-Feb-24	48.41
SW34.Valı	01-Feb-24	51.02556
SW34.Valı	01-Feb-24	51.24111
SW34.Valı	01-Feb-24	42.20556
SW34.Valı	01-Feb-24	42.90556
SW34.Valı	01-Feb-24	53.65889
SW34.Valı	01-Feb-24	44.41
SW34.Valı	01-Feb-24	68.78
SW34.Valı	01-Feb-24	44.41
SW34.Valı	02-Feb-24	45.70333
SW34.Valı	02-Feb-24	37.88778
SW34.Valı	02-Feb-24	46.26556
SW34.Valı	02-Feb-24	29.63222
SW34.Valı	02-Feb-24	362.6783
SW34.Valı	02-Feb-24	141.7522
SW34.Valı	02-Feb-24	28.72556
SW34.Valı	02-Feb-24	17.41
SW34.Valı	02-Feb-24	29.31667
SW34.Valı	02-Feb-24	19.97
SW34.Valı	03-Feb-24	20.46333
SW34.Valı	03-Feb-24	31.41
SW34.Valı	03-Feb-24	32.71222
SW34.Valı	03-Feb-24	19.27127
SW34.Valı	03-Feb-24	141.6289
SW34.Valı	03-Feb-24	23.13889
SW34.Valı	03-Feb-24	19.98111
SW34.Valı	03-Feb-24	2.154444
SW34.Valı	03-Feb-24	1.998889
SW34.Valı	03-Feb-24	1.793333
SW34.Valı	04-Feb-24	15.21
SW34.Valı	04-Feb-24	12.07667
SW34.Valı	04-Feb-24	18.03667
SW34.Valı	04-Feb-24	10.51222
SW34.Valı	04-Feb-24	150.7433
SW34.Valı	04-Feb-24	98.37444
SW34.Valı	04-Feb-24	70.90667
SW34.Valı	04-Feb-24	-23.7056
SW34.Valı	04-Feb-24	5.942222
SW34.Valı	05-Feb-24	20.36333
SW34.Valı	05-Feb-24	13.59
SW34.Valı	05-Feb-24	11.21
SW34.Valı	05-Feb-24	23.107
SW34.Valı	05-Feb-24	9.41
SW34.Valı	05-Feb-24	1.41

SW33.Val	06-Feb-23	55.65745
SW33.Val	06-Feb-23	55
SW33.Val	06-Feb-23	51.74456
SW33.Val	06-Feb-23	50.11647
SW33.Val	06-Feb-23	33.28631
SW33.Val	06-Feb-23	44.22722
SW33.Val	06-Feb-23	40.45962
SW33.Val	06-Feb-23	44.9608
SW33.Val	06-Feb-23	52.59111
SW33.Val	06-Feb-23	50.35738
SW33.Val	07-Feb-23	53.6595
SW33.Val	07-Feb-23	49.0802
SW33.Val	07-Feb-23	49
SW33.Val	07-Feb-23	47.56
SW33.Val	07-Feb-23	23.98
SW33.Val	07-Feb-23	17.15847
SW33.Val	07-Feb-23	98.55276
SW33.Val	07-Feb-23	320.0408
SW33.Val	07-Feb-23	305.4813
SW33.Val	07-Feb-23	47.5588
SW33.Val	08-Feb-23	45.32167
SW33.Val	08-Feb-23	48.8801
SW33.Val	08-Feb-23	45.4813
SW33.Val	08-Feb-23	34.25688
SW33.Val	08-Feb-23	297.5585
SW33.Val	08-Feb-23	304.6395
SW33.Val	08-Feb-23	320
SW33.Val	08-Feb-23	324.638
SW33.Val	08-Feb-23	328
SW33.Val	08-Feb-23	323
SW33.Val	09-Feb-23	322.6608
SW33.Val	09-Feb-23	45.11779
SW33.Val	09-Feb-23	61.9975
SW33.Val	09-Feb-23	322.6898
SW33.Val	09-Feb-23	318.2779
SW33.Val	09-Feb-23	318
SW33.Val	09-Feb-23	334.461
SW33.Val	09-Feb-23	328
SW33.Val	09-Feb-23	330
SW33.Val	09-Feb-23	328
SW33.Val	10-Feb-23	324.3381
SW33.Val	10-Feb-23	308.0783
SW33.Val	10-Feb-23	15.74833
SW33.Val	10-Feb-23	321.3789
SW33.Val	10-Feb-23	318.8587
SW33.Val	10-Feb-23	320.8383
SW33.Val	10-Feb-23	320.461
SW33.Val	10-Feb-23	319.5196
SW33.Val	10-Feb-23	103.3177
SW33.Val	10-Feb-23	315.6421
SW33.Val	11-Feb-23	21.5625
SW33.Val	11-Feb-23	31.8
SW33.Val	11-Feb-23	41

SW33.Val	11-Feb-23	314.6428
SW33.Val	11-Feb-23	300.125
SW33.Val	11-Feb-23	286.0445
SW33.Val	11-Feb-23	295.19
SW33.Val	11-Feb-23	297.1672
SW33.Val	11-Feb-23	297.47
SW33.Val	12-Feb-23	212.8481
SW33.Val	12-Feb-23	47.67223
SW33.Val	12-Feb-23	50.11
SW33.Val	12-Feb-23	49.18417
SW33.Val	12-Feb-23	251.4961
SW33.Val	12-Feb-23	23.57962
SW33.Val	12-Feb-23	29.04082
SW33.Val	12-Feb-23	39
SW33.Val	12-Feb-23	32.8197
SW33.Val	12-Feb-23	102.4971
SW33.Val	13-Feb-23	-61.0922
SW33.Val	13-Feb-23	-132.454
SW33.Val	13-Feb-23	33.03673
SW33.Val	13-Feb-23	41.15237
SW33.Val	13-Feb-23	-141.184
SW33.Val	13-Feb-23	22.11959
SW33.Val	13-Feb-23	30.93889
SW33.Val	13-Feb-23	41.21089
SW33.Val	13-Feb-23	51.23726
SW33.Val	13-Feb-23	51
SW33.Val	14-Feb-23	51.09202
SW33.Val	14-Feb-23	50
SW33.Val	14-Feb-23	51.03824
SW33.Val	14-Feb-23	48
SW33.Val	14-Feb-23	193.9136
SW33.Val	14-Feb-23	76.82086
SW33.Val	14-Feb-23	448.0692
SW33.Val	14-Feb-23	219.6892
SW33.Val	14-Feb-23	50.84265
SW33.Val	14-Feb-23	51.81283
SW33.Val	15-Feb-23	46
SW33.Val	15-Feb-23	45.83208
SW33.Val	15-Feb-23	46.03503
SW33.Val	15-Feb-23	44
SW33.Val	15-Feb-23	37.16908
SW33.Val	15-Feb-23	35.2055
SW33.Val	15-Feb-23	36.1618
SW33.Val	15-Feb-23	44.4625
SW33.Val	15-Feb-23	262.8525
SW33.Val	15-Feb-23	270
SW33.Val	16-Feb-23	273.905
SW33.Val	16-Feb-23	272.3264
SW33.Val	16-Feb-23	272.8962
SW33.Val	16-Feb-23	270.1496
SW33.Val	16-Feb-23	32.61773
SW33.Val	16-Feb-23	28.045
SW33.Val	16-Feb-23	37.50291

SW33.Val	16-Feb-23	52.395
SW33.Val	16-Feb-23	146.8019
SW33.Val	16-Feb-23	270.6951
SW33.Val	17-Feb-23	270.0975
SW33.Val	17-Feb-23	271.9925
SW33.Val	17-Feb-23	273.7945
SW33.Val	17-Feb-23	261.4073
SW33.Val	17-Feb-23	28.74102
SW33.Val	17-Feb-23	33.20142
SW33.Val	17-Feb-23	43.16583
SW33.Val	17-Feb-23	45.81722
SW33.Val	17-Feb-23	51.15778
SW33.Val	17-Feb-23	259
SW33.Val	18-Feb-23	264.6333
SW33.Val	18-Feb-23	190.3159
SW33.Val	18-Feb-23	263.8154
SW33.Val	18-Feb-23	194.2949
SW33.Val	18-Feb-23	30.04226
SW33.Val	18-Feb-23	32.86462
SW33.Val	18-Feb-23	38.27862
SW33.Val	18-Feb-23	46.04444
SW33.Val	18-Feb-23	50.23333
SW33.Val	19-Feb-23	49.93256
SW33.Val	19-Feb-23	51.09774
SW33.Val	19-Feb-23	42.9975
SW33.Val	19-Feb-23	130.3288
SW33.Val	19-Feb-23	32.07
SW33.Val	19-Feb-23	32.2975
SW33.Val	19-Feb-23	32.86608
SW33.Val	19-Feb-23	39.17293
SW33.Val	19-Feb-23	48.46617
SW33.Val	19-Feb-23	49.7675
SW33.Val	20-Feb-23	47.7975
SW33.Val	20-Feb-23	44
SW33.Val	20-Feb-23	40.66389
SW33.Val	20-Feb-23	40.07917
SW33.Val	20-Feb-23	38.46333
SW33.Val	20-Feb-23	34.56761
SW33.Val	20-Feb-23	35.52799
SW33.Val	20-Feb-23	41.16833
SW33.Val	20-Feb-23	49.46833
SW33.Val	20-Feb-23	49.23231
SW33.Val	21-Feb-23	45.06417
SW33.Val	21-Feb-23	49.36917
SW33.Val	21-Feb-23	54
SW33.Val	21-Feb-23	47.03204
SW33.Val	21-Feb-23	40.92512
SW33.Val	21-Feb-23	36.7
SW33.Val	21-Feb-23	35.26167
SW33.Val	21-Feb-23	50
SW33.Val	21-Feb-23	47.12333
SW33.Val	21-Feb-23	44.23019
SW33.Val	22-Feb-23	44.7925

SW33.Val	22-Feb-23	46.89158
SW33.Val	22-Feb-23	44.67
SW33.Val	22-Feb-23	45.42178
SW33.Val	22-Feb-23	37.53865
SW33.Val	22-Feb-23	35.72864
SW33.Val	22-Feb-23	36.08543
SW33.Val	22-Feb-23	44
SW33.Val	22-Feb-23	46.59398
SW33.Val	22-Feb-23	47.30424
SW33.Val	23-Feb-23	47.06773
SW33.Val	23-Feb-23	48.74124
SW33.Val	23-Feb-23	48
SW33.Val	23-Feb-23	48.02917
SW33.Val	23-Feb-23	33.19154
SW33.Val	23-Feb-23	32
SW33.Val	23-Feb-23	84.30911
SW33.Val	23-Feb-23	52.68163
SW33.Val	23-Feb-23	50
SW33.Val	23-Feb-23	47.3125
SW33.Val	24-Feb-23	49
SW33.Val	24-Feb-23	44.37083
SW33.Val	24-Feb-23	46.67083
SW33.Val	24-Feb-23	44.05667
SW33.Val	24-Feb-23	28.72901
SW33.Val	24-Feb-23	13.86167
SW33.Val	24-Feb-23	10.465
SW33.Val	24-Feb-23	35.16917
SW33.Val	24-Feb-23	41.585
SW33.Val	24-Feb-23	37.685
SW33.Val	25-Feb-23	32.64554
SW33.Val	25-Feb-23	38.48667
SW33.Val	25-Feb-23	39.31333
SW33.Val	25-Feb-23	40.06884
SW33.Val	25-Feb-23	26.83459
SW33.Val	25-Feb-23	29.8625
SW33.Val	25-Feb-23	27.8325
SW33.Val	25-Feb-23	24.18057
SW33.Val	25-Feb-23	43.3625
SW33.Val	26-Feb-23	48.6825
SW33.Val	26-Feb-23	45.0725
SW33.Val	26-Feb-23	46
SW33.Val	26-Feb-23	44.16042
SW33.Val	26-Feb-23	676.0425
SW33.Val	26-Feb-23	27.36
SW33.Val	26-Feb-23	27.13333
SW33.Val	26-Feb-23	37.38
SW33.Val	26-Feb-23	6.216722
SW33.Val	26-Feb-23	43.84
SW33.Val	27-Feb-23	42.36
SW33.Val	27-Feb-23	42.70667
SW33.Val	27-Feb-23	38.02078
SW33.Val	27-Feb-23	25.74397
SW33.Val	27-Feb-23	30.91521

SW33.Val	27-Feb-23	11.93089
SW33.Val	27-Feb-23	10.9166
SW33.Val	27-Feb-23	7.29602
SW33.Val	27-Feb-23	1.381415
SW33.Val	27-Feb-23	39
SW33.Val	28-Feb-23	30.04817
SW33.Val	28-Feb-23	83.27485
SW33.Val	28-Feb-23	6.721667
SW33.Val	28-Feb-23	8.345625
SW33.Val	28-Feb-23	24.10333
SW33.Val	28-Feb-23	531.6553
SW33.Val	28-Feb-23	22
SW33.Val	28-Feb-23	3.149805
SW33.Val	28-Feb-23	45
SW33.Val	28-Feb-23	44.1
SW33.Val	01-Mar-23	41
SW33.Val	01-Mar-23	43.3
SW33.Val	01-Mar-23	46.12281
SW33.Val	01-Mar-23	39.3514
SW33.Val	01-Mar-23	29.67514
SW33.Val	01-Mar-23	26.10546
SW33.Val	01-Mar-23	29.28678
SW33.Val	01-Mar-23	41.52125
SW33.Val	01-Mar-23	21.54443
SW33.Val	01-Mar-23	41
SW33.Val	02-Mar-23	42.77083
SW33.Val	02-Mar-23	35.89348
SW33.Val	02-Mar-23	38.56328
SW33.Val	02-Mar-23	35.32917
SW33.Val	02-Mar-23	1.416339
SW33.Val	02-Mar-23	20.76789
SW33.Val	02-Mar-23	-56.708
SW33.Val	02-Mar-23	36.08597
SW33.Val	02-Mar-23	8.275
SW33.Val	02-Mar-23	4.951667
SW33.Val	03-Mar-23	7.33
SW33.Val	03-Mar-23	7
SW33.Val	03-Mar-23	6.376667
SW33.Val	03-Mar-23	30.94
SW33.Val	03-Mar-23	25.04667
SW33.Val	03-Mar-23	30
SW33.Val	03-Mar-23	31.69909
SW33.Val	03-Mar-23	243.2511
SW33.Val	03-Mar-23	14.77
SW33.Val	03-Mar-23	13.57226
SW33.Val	04-Mar-23	5.2225
SW33.Val	04-Mar-23	5.927318
SW33.Val	04-Mar-23	4.126866
SW33.Val	04-Mar-23	32.6125
SW33.Val	04-Mar-23	16.97628
SW33.Val	04-Mar-23	-1.97257
SW33.Val	04-Mar-23	19.24
SW33.Val	04-Mar-23	36.396

SW33.Val	04-Mar-23	37.44013
SW33.Val	04-Mar-23	17.6575
SW33.Val	05-Mar-23	17.88073
SW33.Val	05-Mar-23	10
SW33.Val	05-Mar-23	29.86783
SW33.Val	05-Mar-23	33.9475
SW33.Val	05-Mar-23	26.19517
SW33.Val	05-Mar-23	32.13792
SW33.Val	05-Mar-23	37.52611
SW33.Val	05-Mar-23	36.70157
SW33.Val	05-Mar-23	37.58917
SW33.Val	06-Mar-23	38.47833
SW33.Val	06-Mar-23	-3.77778
SW33.Val	06-Mar-23	22.47953
SW33.Val	06-Mar-23	-0.75782
SW33.Val	06-Mar-23	29.57525
SW33.Val	06-Mar-23	-106.364
SW33.Val	06-Mar-23	28.59444
SW33.Val	06-Mar-23	35.40478
SW33.Val	06-Mar-23	43.24167
SW33.Val	06-Mar-23	46.08958
SW33.Val	07-Mar-23	8.083333
SW33.Val	07-Mar-23	11.22018
SW33.Val	07-Mar-23	13.32
SW33.Val	07-Mar-23	21.10417
SW33.Val	07-Mar-23	25
SW33.Val	07-Mar-23	0.804919
SW33.Val	07-Mar-23	24.39583
SW33.Val	07-Mar-23	37.89759
SW33.Val	07-Mar-23	26.92032
SW33.Val	07-Mar-23	11.95625
SW33.Val	08-Mar-23	21.39583
SW33.Val	08-Mar-23	30.44195
SW33.Val	08-Mar-23	26.86517
SW33.Val	08-Mar-23	25
SW33.Val	08-Mar-23	20.21482
SW33.Val	08-Mar-23	-22.85
SW33.Val	08-Mar-23	32.44361
SW33.Val	08-Mar-23	35
SW33.Val	08-Mar-23	13.96
SW33.Val	08-Mar-23	404.528
SW33.Val	09-Mar-23	33.10993
SW33.Val	09-Mar-23	694
SW33.Val	09-Mar-23	694
SW33.Val	09-Mar-23	439.9842
SW33.Val	09-Mar-23	25.88778
SW33.Val	09-Mar-23	25
SW33.Val	09-Mar-23	379.6172
SW33.Val	09-Mar-23	694
SW33.Val	09-Mar-23	419
SW33.Val	09-Mar-23	34.06028
SW33.Val	10-Mar-23	48.92027
SW33.Val	10-Mar-23	694

SW33.Val	10-Mar-23	694
SW33.Val	10-Mar-23	28.09167
SW33.Val	10-Mar-23	19.3375
SW33.Val	10-Mar-23	11.79236
SW33.Val	10-Mar-23	61.61069
SW33.Val	10-Mar-23	-2.29161
SW33.Val	10-Mar-23	367.1583
SW33.Val	10-Mar-23	166.6736
SW33.Val	11-Mar-23	267.895
SW33.Val	11-Mar-23	156.0611
SW33.Val	11-Mar-23	78.63219
SW33.Val	11-Mar-23	44.3825
SW33.Val	11-Mar-23	37.36286
SW33.Val	11-Mar-23	36.05985
SW33.Val	11-Mar-23	46.2825
SW33.Val	11-Mar-23	49.16504
SW33.Val	11-Mar-23	46
SW33.Val	11-Mar-23	47
SW33.Val	12-Mar-23	45.51876
SW33.Val	12-Mar-23	44.96914
SW33.Val	12-Mar-23	47
SW33.Val	12-Mar-23	34
SW33.Val	12-Mar-23	30.50844
SW33.Val	12-Mar-23	17.82657
SW33.Val	12-Mar-23	1.595331
SW33.Val	12-Mar-23	44.5825
SW33.Val	12-Mar-23	24.23147
SW33.Val	13-Mar-23	38
SW33.Val	13-Mar-23	42.74846
SW33.Val	13-Mar-23	46.39107
SW33.Val	13-Mar-23	45.91896
SW33.Val	13-Mar-23	41.08333
SW33.Val	13-Mar-23	41
SW33.Val	13-Mar-23	45.86628
SW33.Val	13-Mar-23	48.43428
SW33.Val	13-Mar-23	265.2547
SW33.Val	13-Mar-23	289.3863
SW33.Val	14-Mar-23	247.148
SW33.Val	14-Mar-23	135.5833
SW33.Val	14-Mar-23	103.2165
SW33.Val	14-Mar-23	75.66333
SW33.Val	14-Mar-23	55.38417
SW33.Val	14-Mar-23	40.47474
SW33.Val	14-Mar-23	27.11083
SW33.Val	14-Mar-23	42.12949
SW33.Val	14-Mar-23	53.41978
SW33.Val	14-Mar-23	49
SW33.Val	15-Mar-23	41.67791
SW33.Val	15-Mar-23	42.25949
SW33.Val	15-Mar-23	38.07917
SW33.Val	15-Mar-23	42.75439
SW33.Val	15-Mar-23	6.383721
SW33.Val	15-Mar-23	9.538206

SW33.Val	15-Mar-23	19.32278
SW33.Val	15-Mar-23	33.43
SW33.Val	15-Mar-23	35
SW33.Val	15-Mar-23	36
SW33.Val	16-Mar-23	31.09151
SW33.Val	16-Mar-23	34.5175
SW33.Val	16-Mar-23	35.07244
SW33.Val	16-Mar-23	34
SW33.Val	16-Mar-23	23.9202
SW33.Val	16-Mar-23	17.31671
SW33.Val	16-Mar-23	10.90985
SW33.Val	16-Mar-23	23.285
SW33.Val	16-Mar-23	16
SW33.Val	16-Mar-23	27.17813
SW33.Val	17-Mar-23	28.0375
SW33.Val	17-Mar-23	27
SW33.Val	17-Mar-23	25.21417
SW33.Val	17-Mar-23	23.57083
SW33.Val	17-Mar-23	7.929167
SW33.Val	17-Mar-23	-11.5708
SW33.Val	17-Mar-23	2.526996
SW33.Val	17-Mar-23	17.42022
SW33.Val	17-Mar-23	21.80478
SW33.Val	17-Mar-23	17.15235
SW33.Val	18-Mar-23	23.4425
SW33.Val	18-Mar-23	23.03091
SW33.Val	18-Mar-23	22.50083
SW33.Val	18-Mar-23	16.65667
SW33.Val	18-Mar-23	-7.52579
SW33.Val	18-Mar-23	-5.2401
SW33.Val	18-Mar-23	15.915
SW33.Val	18-Mar-23	19.28928
SW33.Val	18-Mar-23	19.37797
SW33.Val	18-Mar-23	21.66
SW33.Val	19-Mar-23	19.49458
SW33.Val	19-Mar-23	23.53878
SW33.Val	19-Mar-23	23.36
SW33.Val	19-Mar-23	8.578112
SW33.Val	19-Mar-23	-16.4572
SW33.Val	19-Mar-23	-6.94
SW33.Val	19-Mar-23	0.8
SW33.Val	19-Mar-23	3.433333
SW33.Val	19-Mar-23	8.293628
SW33.Val	20-Mar-23	6.774812
SW33.Val	20-Mar-23	15.81364
SW33.Val	20-Mar-23	21.35803
SW33.Val	20-Mar-23	12.394
SW33.Val	20-Mar-23	-4.35
SW33.Val	20-Mar-23	-6.30625
SW33.Val	20-Mar-23	-6.57303
SW33.Val	20-Mar-23	-2
SW33.Val	20-Mar-23	-5.28738
SW33.Val	20-Mar-23	0.9375

SW33.Val	21-Mar-23	6.65586
SW33.Val	21-Mar-23	2.811667
SW33.Val	21-Mar-23	6
SW33.Val	21-Mar-23	4.18125
SW33.Val	21-Mar-23	-2.825
SW33.Val	21-Mar-23	-9.775
SW33.Val	21-Mar-23	8.062241
SW33.Val	21-Mar-23	7.962406
SW33.Val	21-Mar-23	9.558333
SW33.Val	21-Mar-23	12.41167
SW33.Val	22-Mar-23	6.558333
SW33.Val	22-Mar-23	9.566486
SW33.Val	22-Mar-23	6
SW33.Val	22-Mar-23	1.787022
SW33.Val	22-Mar-23	-7.97167
SW33.Val	22-Mar-23	11.175
SW33.Val	22-Mar-23	-3.61
SW33.Val	22-Mar-23	5.976686
SW33.Val	22-Mar-23	12.43274
SW33.Val	22-Mar-23	15.58833
SW33.Val	23-Mar-23	11.88907
SW33.Val	23-Mar-23	13
SW33.Val	23-Mar-23	12.46384
SW33.Val	23-Mar-23	12.78864
SW33.Val	23-Mar-23	-1.91083
SW33.Val	23-Mar-23	-0.21667
SW33.Val	23-Mar-23	4.277083
SW33.Val	23-Mar-23	12.31528
SW33.Val	23-Mar-23	11.42167
SW33.Val	23-Mar-23	9.768974
SW33.Val	24-Mar-23	2.554167
SW33.Val	24-Mar-23	8.19
SW33.Val	24-Mar-23	14.55204
SW33.Val	24-Mar-23	7.157369
SW33.Val	24-Mar-23	-13.9352
SW33.Val	24-Mar-23	-1.4794
SW33.Val	24-Mar-23	2.896228
SW33.Val	24-Mar-23	-0.01
SW33.Val	24-Mar-23	-0.7125
SW33.Val	24-Mar-23	-2.82
SW33.Val	25-Mar-23	15.31109
SW33.Val	25-Mar-23	-5.405
SW33.Val	25-Mar-23	12.72
SW33.Val	25-Mar-23	6.517902
SW33.Val	25-Mar-23	10.89552
SW33.Val	25-Mar-23	23.49
SW33.Val	25-Mar-23	25.38
SW33.Val	25-Mar-23	17.6389
SW33.Val	25-Mar-23	-1.41833
SW33.Val	25-Mar-23	9.027882
SW33.Val	26-Mar-23	11.89351
SW33.Val	26-Mar-23	15.5725
SW33.Val	26-Mar-23	12

SW33.Val	26-Mar-23	11.58167
SW33.Val	26-Mar-23	-3.36333
SW33.Val	26-Mar-23	-5.04042
SW33.Val	26-Mar-23	11.36636
SW33.Val	26-Mar-23	6.036636
SW33.Val	26-Mar-23	3
SW33.Val	26-Mar-23	6.408674
SW33.Val	27-Mar-23	8.659734
SW33.Val	27-Mar-23	8
SW33.Val	27-Mar-23	6.263421
SW33.Val	27-Mar-23	-4.95833
SW33.Val	27-Mar-23	14.12281
SW33.Val	27-Mar-23	7.341667
SW33.Val	27-Mar-23	5.766667
SW33.Val	27-Mar-23	28.80595
SW33.Val	27-Mar-23	13.12759
SW33.Val	28-Mar-23	7.716667
SW33.Val	28-Mar-23	7
SW33.Val	28-Mar-23	12.25417
SW33.Val	28-Mar-23	2.635417
SW33.Val	28-Mar-23	-1.79167
SW33.Val	28-Mar-23	-6.0985
SW33.Val	28-Mar-23	-8.69167
SW33.Val	28-Mar-23	3
SW33.Val	28-Mar-23	16.00499
SW33.Val	28-Mar-23	13.79851
SW33.Val	29-Mar-23	17.77444
SW33.Val	29-Mar-23	8.86
SW33.Val	29-Mar-23	15.57774
SW33.Val	29-Mar-23	15.50832
SW33.Val	29-Mar-23	12.16279
SW33.Val	29-Mar-23	5.74
SW33.Val	29-Mar-23	3.9625
SW33.Val	29-Mar-23	10.7691
SW33.Val	29-Mar-23	14.60933
SW33.Val	29-Mar-23	27.16043
SW33.Val	30-Mar-23	21.59333
SW33.Val	30-Mar-23	1.04
SW33.Val	30-Mar-23	8.425585
SW33.Val	30-Mar-23	8.64
SW33.Val	30-Mar-23	11.73556
SW33.Val	30-Mar-23	23
SW33.Val	30-Mar-23	22
SW33.Val	30-Mar-23	26.53333
SW33.Val	30-Mar-23	6.12291
SW33.Val	30-Mar-23	29.14708
SW33.Val	31-Mar-23	26.435
SW33.Val	31-Mar-23	29.89417
SW33.Val	31-Mar-23	26
SW33.Val	31-Mar-23	29.23003
SW33.Val	31-Mar-23	12.02917
SW33.Val	31-Mar-23	23.87455
SW33.Val	31-Mar-23	25.36697

SW33.Val	31-Mar-23	32.17302
SW33.Val	31-Mar-23	25.98251
SW33.Val	31-Mar-23	27
SW33.Val	01-Apr-23	23.37667
SW33.Val	01-Apr-23	25.21167
SW33.Val	01-Apr-23	26
SW33.Val	01-Apr-23	24.2425
SW33.Val	01-Apr-23	16.3975
SW33.Val	01-Apr-23	15.38
SW33.Val	01-Apr-23	21.57393
SW33.Val	01-Apr-23	38.44167
SW33.Val	01-Apr-23	92.40867
SW33.Val	01-Apr-23	81.97083
SW33.Val	02-Apr-23	43.90192
SW33.Val	02-Apr-23	42.69865
SW33.Val	02-Apr-23	41.49538
SW33.Val	02-Apr-23	40.2921
SW33.Val	02-Apr-23	39.08883
SW33.Val	02-Apr-23	37.88555
SW33.Val	02-Apr-23	36.68228
SW33.Val	02-Apr-23	35.479
SW33.Val	02-Apr-23	34.27573
SW33.Val	02-Apr-23	33.07245
SW33.Val	03-Apr-23	31.86918
SW33.Val	03-Apr-23	30.6659
SW33.Val	03-Apr-23	29.46263
SW33.Val	03-Apr-23	21.00833
SW33.Val	03-Apr-23	15
SW33.Val	03-Apr-23	17.09583
SW33.Val	03-Apr-23	24.79233
SW33.Val	03-Apr-23	30
SW33.Val	03-Apr-23	31.99247
SW33.Val	04-Apr-23	26.59333
SW33.Val	04-Apr-23	27.41701
SW33.Val	04-Apr-23	26.05167
SW33.Val	04-Apr-23	24.80333
SW33.Val	04-Apr-23	20.48543
SW33.Val	04-Apr-23	14.38847
SW33.Val	04-Apr-23	13.04833
SW33.Val	04-Apr-23	20.59225
SW33.Val	04-Apr-23	25.69493
SW33.Val	04-Apr-23	25.995
SW33.Val	05-Apr-23	27.59148
SW33.Val	05-Apr-23	24.5975
SW33.Val	05-Apr-23	19.02585
SW33.Val	05-Apr-23	27.59875
SW33.Val	05-Apr-23	19.4875
SW33.Val	05-Apr-23	16.405
SW33.Val	05-Apr-23	14.9275
SW33.Val	05-Apr-23	11.398
SW33.Val	05-Apr-23	23.22388
SW33.Val	05-Apr-23	20.995
SW33.Val	06-Apr-23	25.04413

SW33.Val	06-Apr-23	38.19667
SW33.Val	06-Apr-23	30
SW33.Val	06-Apr-23	35
SW33.Val	06-Apr-23	22
SW33.Val	06-Apr-23	19.02339
SW33.Val	06-Apr-23	24.54917
SW33.Val	06-Apr-23	22.79365
SW33.Val	06-Apr-23	24.4743
SW33.Val	06-Apr-23	21.00417
SW33.Val	07-Apr-23	30.70241
SW33.Val	07-Apr-23	26.86589
SW33.Val	07-Apr-23	25.20384
SW33.Val	07-Apr-23	23.80502
SW33.Val	07-Apr-23	21
SW33.Val	07-Apr-23	12
SW33.Val	07-Apr-23	21.90108
SW33.Val	07-Apr-23	23.37688
SW33.Val	07-Apr-23	23.69083
SW33.Val	07-Apr-23	17.02137
SW33.Val	08-Apr-23	22
SW33.Val	08-Apr-23	21
SW33.Val	08-Apr-23	21
SW33.Val	08-Apr-23	23
SW33.Val	08-Apr-23	11.75292
SW33.Val	08-Apr-23	8.123356
SW33.Val	08-Apr-23	17.09892
SW33.Val	08-Apr-23	4.189526
SW33.Val	08-Apr-23	5.8
SW33.Val	08-Apr-23	20.96509
SW33.Val	09-Apr-23	8.204489
SW33.Val	09-Apr-23	6.2
SW33.Val	09-Apr-23	11.89975
SW33.Val	09-Apr-23	11.4
SW33.Val	09-Apr-23	12.50374
SW33.Val	09-Apr-23	0.594662
SW33.Val	09-Apr-23	9.175036
SW33.Val	09-Apr-23	12.19549
SW33.Val	09-Apr-23	11
SW33.Val	09-Apr-23	11.00083
SW33.Val	10-Apr-23	14.72005
SW33.Val	10-Apr-23	14.91228
SW33.Val	10-Apr-23	8.497076
SW33.Val	10-Apr-23	13.399
SW33.Val	10-Apr-23	12.24208
SW33.Val	10-Apr-23	-4.38724
SW33.Val	10-Apr-23	9.492899
SW33.Val	10-Apr-23	9.399332
SW33.Val	10-Apr-23	12.5125
SW33.Val	11-Apr-23	6.996678
SW33.Val	11-Apr-23	10.79
SW33.Val	11-Apr-23	9.599335
SW33.Val	11-Apr-23	10
SW33.Val	11-Apr-23	3.200833

SW33.Val	11-Apr-23	6.985
SW33.Val	11-Apr-23	5.413333
SW33.Val	11-Apr-23	8.591973
SW33.Val	11-Apr-23	8.597083
SW33.Val	11-Apr-23	9.806667
SW33.Val	12-Apr-23	10.33333
SW33.Val	12-Apr-23	12.60183
SW33.Val	12-Apr-23	14
SW33.Val	12-Apr-23	11.19667
SW33.Val	12-Apr-23	3.596667
SW33.Val	12-Apr-23	-0.83301
SW33.Val	12-Apr-23	4.983333
SW33.Val	12-Apr-23	5.880453
SW33.Val	12-Apr-23	6.606035
SW33.Val	12-Apr-23	13.49088
SW33.Val	13-Apr-23	17.99002
SW33.Val	13-Apr-23	17
SW33.Val	13-Apr-23	15.79667
SW33.Val	13-Apr-23	27.60667
SW33.Val	13-Apr-23	9.18483
SW33.Val	13-Apr-23	5.502082
SW33.Val	13-Apr-23	-3.60233
SW33.Val	13-Apr-23	2.498747
SW33.Val	13-Apr-23	4.401496
SW33.Val	13-Apr-23	8.215
SW33.Val	14-Apr-23	7.006253
SW33.Val	14-Apr-23	2.396509
SW33.Val	14-Apr-23	3.598504
SW33.Val	14-Apr-23	14.1025
SW33.Val	14-Apr-23	2.581395
SW33.Val	14-Apr-23	4.467943
SW33.Val	14-Apr-23	2.087156
SW33.Val	14-Apr-23	7.692884
SW33.Val	14-Apr-23	-2.22
SW33.Val	14-Apr-23	-11.9175
SW33.Val	15-Apr-23	24.95997
SW33.Val	15-Apr-23	12.63
SW33.Val	15-Apr-23	10.76382
SW33.Val	15-Apr-23	26.32277
SW33.Val	15-Apr-23	20.39556
SW33.Val	15-Apr-23	14.49
SW33.Val	15-Apr-23	20.79468
SW33.Val	15-Apr-23	19.89667
SW33.Val	15-Apr-23	14
SW33.Val	15-Apr-23	15.29842
SW33.Val	16-Apr-23	14.02
SW33.Val	16-Apr-23	18.4413
SW33.Val	16-Apr-23	15.37802
SW33.Val	16-Apr-23	14.90333
SW33.Val	16-Apr-23	10.695
SW33.Val	16-Apr-23	4.49
SW33.Val	16-Apr-23	3.5875
SW33.Val	16-Apr-23	10.79419

SW33.Valı	16-Apr-23	12.35104
SW33.Valı	16-Apr-23	16.40833
SW33.Valı	17-Apr-23	18
SW33.Valı	17-Apr-23	12.69583
SW33.Valı	17-Apr-23	13
SW33.Valı	17-Apr-23	13.52123
SW33.Valı	17-Apr-23	6.951707
SW33.Valı	17-Apr-23	14.4771
SW33.Valı	17-Apr-23	26.80225
SW33.Valı	17-Apr-23	24.55137
SW33.Valı	17-Apr-23	20.38
SW33.Valı	17-Apr-23	17.41
SW33.Valı	18-Apr-23	10
SW33.Valı	18-Apr-23	8.78
SW33.Valı	18-Apr-23	12.42202
SW33.Valı	18-Apr-23	17.2875
SW33.Valı	18-Apr-23	9
SW33.Valı	18-Apr-23	21.16694
SW33.Valı	18-Apr-23	22.78803
SW33.Valı	18-Apr-23	29.79307
SW33.Valı	18-Apr-23	19.21303
SW33.Valı	19-Apr-23	12.35333
SW33.Valı	19-Apr-23	13.01337
SW33.Valı	19-Apr-23	14.55533
SW33.Valı	19-Apr-23	16.84667
SW33.Valı	19-Apr-23	19.2825
SW33.Valı	19-Apr-23	4.411667
SW33.Valı	19-Apr-23	7.009967
SW33.Valı	19-Apr-23	9.800999
SW33.Valı	19-Apr-23	9.932331
SW33.Valı	19-Apr-23	15
SW33.Valı	20-Apr-23	10.29417
SW33.Valı	20-Apr-23	9.033333
SW33.Valı	20-Apr-23	13.6941
SW33.Valı	20-Apr-23	11.57333
SW33.Valı	20-Apr-23	12.14
SW33.Valı	20-Apr-23	2.221945
SW33.Valı	20-Apr-23	20.99167
SW33.Valı	20-Apr-23	15.19534
SW33.Valı	20-Apr-23	9
SW33.Valı	20-Apr-23	11.43392
SW33.Valı	21-Apr-23	12.58549
SW33.Valı	21-Apr-23	7.510629
SW33.Valı	21-Apr-23	5.612957
SW33.Valı	21-Apr-23	10.39552
SW33.Valı	21-Apr-23	15
SW33.Valı	21-Apr-23	2.084577
SW33.Valı	21-Apr-23	17.97494
SW33.Valı	21-Apr-23	24.40375
SW33.Valı	21-Apr-23	18.57
SW33.Valı	21-Apr-23	14
SW33.Valı	22-Apr-23	11.755
SW33.Valı	22-Apr-23	19.955

SW33.Val	22-Apr-23	19.69221
SW33.Val	22-Apr-23	13.395
SW33.Val	22-Apr-23	12.90758
SW33.Val	22-Apr-23	4.035774
SW33.Val	22-Apr-23	12.505
SW33.Val	22-Apr-23	17
SW33.Val	22-Apr-23	18
SW33.Val	22-Apr-23	18.775
SW33.Val	23-Apr-23	15.35444
SW33.Val	23-Apr-23	14.98663
SW33.Val	23-Apr-23	10
SW33.Val	23-Apr-23	13.0875
SW33.Val	23-Apr-23	13.63333
SW33.Val	23-Apr-23	8.251043
SW33.Val	23-Apr-23	15.525
SW33.Val	23-Apr-23	26.89342
SW33.Val	23-Apr-23	27
SW33.Val	23-Apr-23	22.81833
SW33.Val	24-Apr-23	12.83667
SW33.Val	24-Apr-23	17.99088
SW33.Val	24-Apr-23	12.9275
SW33.Val	24-Apr-23	8.5175
SW33.Val	24-Apr-23	18.545
SW33.Val	24-Apr-23	17.41833
SW33.Val	24-Apr-23	22.01664
SW33.Val	24-Apr-23	21.76333
SW33.Val	24-Apr-23	26.89009
SW33.Val	24-Apr-23	15.49502
SW33.Val	25-Apr-23	26.67527
SW33.Val	25-Apr-23	17.06417
SW33.Val	25-Apr-23	18.47333
SW33.Val	25-Apr-23	14.86466
SW33.Val	25-Apr-23	16.09
SW33.Val	25-Apr-23	19
SW33.Val	25-Apr-23	23.25407
SW33.Val	25-Apr-23	12.81
SW33.Val	25-Apr-23	18.11009
SW33.Val	26-Apr-23	27.58951
SW33.Val	26-Apr-23	21.87
SW33.Val	26-Apr-23	9.944954
SW33.Val	26-Apr-23	15.24
SW33.Val	26-Apr-23	13
SW33.Val	26-Apr-23	5.446205
SW33.Val	26-Apr-23	20.47583
SW33.Val	26-Apr-23	26.04496
SW33.Val	26-Apr-23	18
SW33.Val	26-Apr-23	22.22167
SW33.Val	27-Apr-23	8.356667
SW33.Val	27-Apr-23	21.42167
SW33.Val	27-Apr-23	19.90242
SW33.Val	27-Apr-23	30.75667
SW33.Val	27-Apr-23	20.58375
SW33.Val	27-Apr-23	17

SW33.Val	27-Apr-23	16.21167
SW33.Val	27-Apr-23	15
SW33.Val	27-Apr-23	16.56845
SW33.Val	27-Apr-23	18.11167
SW33.Val	28-Apr-23	14.53
SW33.Val	28-Apr-23	10.865
SW33.Val	28-Apr-23	13.99333
SW33.Val	28-Apr-23	15.23515
SW33.Val	28-Apr-23	21
SW33.Val	28-Apr-23	14.44167
SW33.Val	28-Apr-23	24
SW33.Val	28-Apr-23	21.08354
SW33.Val	28-Apr-23	26.18833
SW33.Val	28-Apr-23	28.12375
SW33.Val	29-Apr-23	18.9375
SW33.Val	29-Apr-23	20.54478
SW33.Val	29-Apr-23	19.0375
SW33.Val	29-Apr-23	18.87656
SW33.Val	29-Apr-23	16.0375
SW33.Val	29-Apr-23	15.525
SW33.Val	29-Apr-23	21.2075
SW33.Val	29-Apr-23	9.5125
SW33.Val	29-Apr-23	3.977512
SW33.Val	29-Apr-23	2.102757
SW33.Val	30-Apr-23	9.225
SW33.Val	30-Apr-23	10
SW33.Val	30-Apr-23	8.02
SW33.Val	30-Apr-23	11.62355
SW33.Val	30-Apr-23	15.84
SW33.Val	30-Apr-23	13.17181
SW33.Val	30-Apr-23	22.06667
SW33.Val	30-Apr-23	-4.91743
SW33.Val	30-Apr-23	23
SW33.Val	30-Apr-23	3.502919
SW33.Val	01-May-23	19.08267
SW33.Val	01-May-23	17.28591
SW33.Val	01-May-23	14.48
SW33.Val	01-May-23	27
SW33.Val	01-May-23	18.19348
SW33.Val	01-May-23	18.26683
SW33.Val	01-May-23	20.4045
SW33.Val	01-May-23	10.84539
SW33.Val	01-May-23	17.07083
SW33.Val	01-May-23	25.81431
SW33.Val	02-May-23	19.70948
SW33.Val	02-May-23	18.00585
SW33.Val	02-May-23	25.05667
SW33.Val	02-May-23	17
SW33.Val	02-May-23	7.774086
SW33.Val	02-May-23	10.37952
SW33.Val	02-May-23	20.19056
SW33.Val	02-May-23	25.51417
SW33.Val	02-May-23	11.44296

SW33.Val	03-May-23	17.62886
SW33.Val	03-May-23	2.829024
SW33.Val	03-May-23	28.14429
SW33.Val	03-May-23	10.21
SW33.Val	03-May-23	7.743142
SW33.Val	03-May-23	9.693367
SW33.Val	03-May-23	11.83
SW33.Val	03-May-23	14.57895
SW33.Val	03-May-23	10.54243
SW33.Val	03-May-23	8.935162
SW33.Val	04-May-23	9.648333
SW33.Val	04-May-23	7.4125
SW33.Val	04-May-23	14.14286
SW33.Val	04-May-23	15.1202
SW33.Val	04-May-23	0.315263
SW33.Val	04-May-23	14.50746
SW33.Val	04-May-23	21.9783
SW33.Val	04-May-23	11.215
SW33.Val	04-May-23	10
SW33.Val	04-May-23	7
SW33.Val	05-May-23	3.2695
SW33.Val	05-May-23	11.54458
SW33.Val	05-May-23	9
SW33.Val	05-May-23	17.90643
SW33.Val	05-May-23	6
SW33.Val	05-May-23	7.231667
SW33.Val	05-May-23	12.74
SW33.Val	05-May-23	14.91757
SW33.Val	05-May-23	18.51583
SW33.Val	05-May-23	17.6276
SW33.Val	06-May-23	11.76833
SW33.Val	06-May-23	11
SW33.Val	06-May-23	10.85571
SW33.Val	06-May-23	17
SW33.Val	06-May-23	10.73439
SW33.Val	06-May-23	9.463617
SW33.Val	06-May-23	13.37125
SW33.Val	06-May-23	13.08063
SW33.Val	06-May-23	14.93818
SW33.Val	06-May-23	10.74148
SW33.Val	07-May-23	12.11667
SW33.Val	07-May-23	13.41701
SW33.Val	07-May-23	13.71667
SW33.Val	07-May-23	13.94996
SW33.Val	07-May-23	12
SW33.Val	07-May-23	1.768588
SW33.Val	07-May-23	13.8376
SW33.Val	07-May-23	16
SW33.Val	07-May-23	13.4825
SW33.Val	07-May-23	10.08757
SW33.Val	08-May-23	13.53117
SW33.Val	08-May-23	13.165
SW33.Val	08-May-23	13.5875

SW33.Val	08-May-23	22.07
SW33.Val	08-May-23	25.05263
SW33.Val	08-May-23	19.9551
SW33.Val	08-May-23	15.23204
SW33.Val	08-May-23	10.50897
SW33.Val	08-May-23	18.27866
SW33.Val	08-May-23	17.9125
SW33.Val	09-May-23	12.35279
SW33.Val	09-May-23	23.23813
SW33.Val	09-May-23	10.74188
SW33.Val	09-May-23	9
SW33.Val	09-May-23	9.631841
SW33.Val	09-May-23	7.459751
SW33.Val	09-May-23	12.915
SW33.Val	09-May-23	11.03
SW33.Val	09-May-23	15.03258
SW33.Val	10-May-23	12.8175
SW33.Val	10-May-23	12.8825
SW33.Val	10-May-23	12.66138
SW33.Val	10-May-23	13.43142
SW33.Val	10-May-23	11.98435
SW33.Val	10-May-23	7.271059
SW33.Val	10-May-23	0.763333
SW33.Val	10-May-23	6
SW33.Val	10-May-23	10.44357
SW33.Val	10-May-23	8.258642
SW33.Val	11-May-23	9.236452
SW33.Val	11-May-23	8.41125
SW33.Val	11-May-23	9.709167
SW33.Val	11-May-23	11.13383
SW33.Val	11-May-23	4.036667
SW33.Val	11-May-23	3.166249
SW33.Val	11-May-23	3.537313
SW33.Val	11-May-23	8
SW33.Val	11-May-23	10
SW33.Val	11-May-23	7.519059
SW33.Val	12-May-23	7.726062
SW33.Val	12-May-23	7
SW33.Val	12-May-23	3.58368
SW33.Val	12-May-23	11.71893
SW33.Val	12-May-23	0.343499
SW33.Val	12-May-23	1.680833
SW33.Val	12-May-23	7.091061
SW33.Val	12-May-23	8
SW33.Val	12-May-23	9.219167
SW33.Val	12-May-23	12.40709
SW33.Val	13-May-23	5.815186
SW33.Val	13-May-23	7.771667
SW33.Val	13-May-23	1.323333
SW33.Val	13-May-23	11
SW33.Val	13-May-23	15.88304
SW33.Val	13-May-23	2.791493
SW33.Val	13-May-23	9.761667

SW33.Val	13-May-23	13.83833
SW33.Val	13-May-23	11.88
SW33.Val	13-May-23	16.88
SW33.Val	14-May-23	22.3616
SW33.Val	14-May-23	19.11779
SW33.Val	14-May-23	18.4186
SW33.Val	14-May-23	17
SW33.Val	14-May-23	12
SW33.Val	14-May-23	10.4
SW33.Val	14-May-23	7.566085
SW33.Val	14-May-23	17.67839
SW33.Val	14-May-23	14.77935
SW33.Val	14-May-23	14.37811
SW33.Val	15-May-23	14.82
SW33.Val	15-May-23	9.5196
SW33.Val	15-May-23	8.683333
SW33.Val	15-May-23	8
SW33.Val	15-May-23	5.041667
SW33.Val	15-May-23	9.714405
SW33.Val	15-May-23	9.47714
SW33.Val	15-May-23	13.0786
SW33.Val	15-May-23	13.44333
SW33.Val	15-May-23	13.11721
SW33.Val	16-May-23	15
SW33.Val	16-May-23	14
SW33.Val	16-May-23	18
SW33.Val	16-May-23	11.28043
SW33.Val	16-May-23	12.99062
SW33.Val	16-May-23	14.64333
SW33.Val	16-May-23	22.61983
SW33.Val	16-May-23	18.91937
SW33.Val	16-May-23	19.22417
SW33.Val	16-May-23	19.13348
SW33.Val	17-May-23	19.65823
SW33.Val	17-May-23	21
SW33.Val	17-May-23	15.44764
SW33.Val	17-May-23	22.165
SW33.Val	17-May-23	24
SW33.Val	17-May-23	21.68174
SW33.Val	17-May-23	24.3101
SW33.Val	17-May-23	21.134
SW33.Val	17-May-23	24.48844
SW33.Val	18-May-23	26.48062
SW33.Val	18-May-23	18.10491
SW33.Val	18-May-23	29.87833
SW33.Val	18-May-23	28.68087
SW33.Val	18-May-23	15.36083
SW33.Val	18-May-23	24.93532
SW33.Val	18-May-23	22.60117
SW33.Val	18-May-23	26.75689
SW33.Val	18-May-23	17.14299
SW33.Val	18-May-23	12.49648
SW33.Val	19-May-23	15.82659

SW33.Val	19-May-23	11
SW33.Val	19-May-23	20.1224
SW33.Val	19-May-23	19.95504
SW33.Val	19-May-23	23
SW33.Val	19-May-23	24.045
SW33.Val	19-May-23	22.66125
SW33.Val	19-May-23	21.85393
SW33.Val	19-May-23	14.75312
SW33.Val	19-May-23	17.2225
SW33.Val	20-May-23	8.173533
SW33.Val	20-May-23	24.22943
SW33.Val	20-May-23	19.735
SW33.Val	20-May-23	17.6475
SW33.Val	20-May-23	24.87249
SW33.Val	20-May-23	23.5842
SW33.Val	20-May-23	22.2959
SW33.Val	20-May-23	18.94776
SW33.Val	20-May-23	26.68
SW33.Val	20-May-23	13.44638
SW33.Val	21-May-23	20.12718
SW33.Val	21-May-23	23.645
SW33.Val	21-May-23	19.245
SW33.Val	21-May-23	21.48
SW33.Val	21-May-23	21.88722
SW33.Val	21-May-23	21.24055
SW33.Val	21-May-23	22.95795
SW33.Val	21-May-23	24.67534
SW33.Val	21-May-23	10.06742
SW33.Val	21-May-23	12.225
SW33.Val	22-May-23	19.4787
SW33.Val	22-May-23	12.0825
SW33.Val	22-May-23	22
SW33.Val	22-May-23	21.94835
SW33.Val	22-May-23	18.61366
SW33.Val	22-May-23	20.92708
SW33.Val	22-May-23	19
SW33.Val	22-May-23	21.28726
SW33.Val	22-May-23	7.307692
SW33.Val	22-May-23	12.555
SW33.Val	23-May-23	22
SW33.Val	23-May-23	19.4675
SW33.Val	23-May-23	17.53848
SW33.Val	23-May-23	8.107232
SW33.Val	23-May-23	21.16209
SW33.Val	23-May-23	19.604
SW33.Val	23-May-23	19
SW33.Val	23-May-23	18
SW33.Val	23-May-23	14.13341
SW33.Val	23-May-23	10.76
SW33.Val	24-May-23	16.73434
SW33.Val	24-May-23	13.06088
SW33.Val	24-May-23	20.04111
SW33.Val	24-May-23	17.88574

SW33.Val	24-May-23	22.15609
SW33.Val	24-May-23	21.98878
SW33.Val	24-May-23	24
SW33.Val	24-May-23	23.56929
SW33.Val	24-May-23	24
SW33.Val	25-May-23	20.7771
SW33.Val	25-May-23	15.29825
SW33.Val	25-May-23	13.4025
SW33.Val	25-May-23	14.43967
SW33.Val	25-May-23	16.57702
SW33.Val	25-May-23	20.23333
SW33.Val	25-May-23	21.05613
SW33.Val	25-May-23	23.32306
SW33.Val	25-May-23	17.62178
SW33.Val	25-May-23	19
SW33.Val	26-May-23	10.27899
SW33.Val	26-May-23	19.04667
SW33.Val	26-May-23	8.12
SW33.Val	26-May-23	16.4921
SW33.Val	26-May-23	12.31605
SW33.Val	26-May-23	13.26812
SW33.Val	26-May-23	14.22019
SW33.Val	26-May-23	15
SW33.Val	26-May-23	11.72241
SW33.Val	26-May-23	16.80809
SW33.Val	27-May-23	19.6608
SW33.Val	27-May-23	19.71393
SW33.Val	27-May-23	21.82333
SW33.Val	27-May-23	20.75874
SW33.Val	27-May-23	14
SW33.Val	27-May-23	15.69865
SW33.Val	27-May-23	9.511676
SW33.Val	27-May-23	9.035747
SW33.Val	27-May-23	9.847009
SW33.Val	27-May-23	16
SW33.Val	28-May-23	9.34
SW33.Val	28-May-23	6.618651
SW33.Val	28-May-23	16.35422
SW33.Val	28-May-23	12.83319
SW33.Val	28-May-23	16.88333
SW33.Val	28-May-23	15.81638
SW33.Val	28-May-23	15.97591
SW33.Val	28-May-23	17.20753
SW33.Val	28-May-23	15
SW33.Val	28-May-23	14.52618
SW33.Val	29-May-23	4.317687
SW33.Val	29-May-23	15.71
SW33.Val	29-May-23	17.55852
SW33.Val	29-May-23	20.13156
SW33.Val	29-May-23	16.42381
SW33.Val	29-May-23	13.63682
SW33.Val	29-May-23	16.0931
SW33.Val	29-May-23	12.95611

SW33.Val	29-May-23	13.13761
SW33.Val	29-May-23	28.00167
SW33.Val	30-May-23	18.89333
SW33.Val	30-May-23	14.52073
SW33.Val	30-May-23	16.47
SW33.Val	30-May-23	18
SW33.Val	30-May-23	18.89056
SW33.Val	30-May-23	16.12686
SW33.Val	30-May-23	18.95333
SW33.Val	30-May-23	13.54851
SW33.Val	30-May-23	15.13372
SW33.Val	30-May-23	11.81645
SW33.Val	31-May-23	11.66833
SW33.Val	31-May-23	15.61667
SW33.Val	31-May-23	13.64578
SW33.Val	31-May-23	15.24667
SW33.Val	31-May-23	14.19357
SW33.Val	31-May-23	12.58431
SW33.Val	31-May-23	17.95329
SW33.Val	31-May-23	21.35333
SW33.Val	31-May-23	17.13
SW33.Val	01-Jun-23	12
SW33.Val	01-Jun-23	15.22305
SW33.Val	01-Jun-23	14.47754
SW33.Val	01-Jun-23	16.29431
SW33.Val	01-Jun-23	14.75333
SW33.Val	01-Jun-23	12.20933
SW33.Val	01-Jun-23	14.845
SW33.Val	01-Jun-23	11.02333
SW33.Val	01-Jun-23	15
SW33.Val	01-Jun-23	16.68907
SW33.Val	02-Jun-23	12
SW33.Val	02-Jun-23	11.977
SW33.Val	02-Jun-23	11.95001
SW33.Val	02-Jun-23	11.92302
SW33.Val	02-Jun-23	11.89604
SW33.Val	02-Jun-23	11.86905
SW33.Val	02-Jun-23	11.84206
SW33.Val	02-Jun-23	11.81508
SW33.Val	02-Jun-23	11.78809
SW33.Val	02-Jun-23	11.7611
SW33.Val	03-Jun-23	11.73411
SW33.Val	03-Jun-23	11.70713
SW33.Val	03-Jun-23	11.68014
SW33.Val	03-Jun-23	11.65315
SW33.Val	03-Jun-23	11.62616
SW33.Val	03-Jun-23	11.59918
SW33.Val	03-Jun-23	11.57219
SW33.Val	03-Jun-23	11.5452
SW33.Val	03-Jun-23	11.51821
SW33.Val	03-Jun-23	11.49123
SW33.Val	04-Jun-23	11.46424
SW33.Val	04-Jun-23	11.43725

SW33.Val	04-Jun-23	11.41027
SW33.Val	04-Jun-23	11.38328
SW33.Val	04-Jun-23	11.35629
SW33.Val	04-Jun-23	11.3293
SW33.Val	04-Jun-23	11.30232
SW33.Val	04-Jun-23	11.27533
SW33.Val	04-Jun-23	11.24834
SW33.Val	04-Jun-23	11.22135
SW33.Val	05-Jun-23	11.19437
SW33.Val	05-Jun-23	11.16738
SW33.Val	05-Jun-23	11.14039
SW33.Val	05-Jun-23	11.11341
SW33.Val	05-Jun-23	11.08642
SW33.Val	05-Jun-23	11.05943
SW33.Val	05-Jun-23	11.03244
SW33.Val	05-Jun-23	11.00546
SW33.Val	05-Jun-23	10.97847
SW33.Val	05-Jun-23	10.95148
SW33.Val	06-Jun-23	10.92449
SW33.Val	06-Jun-23	10.89751
SW33.Val	06-Jun-23	10.87052
SW33.Val	06-Jun-23	10.84353
SW33.Val	06-Jun-23	10.81654
SW33.Val	06-Jun-23	10.78956
SW33.Val	06-Jun-23	10.76257
SW33.Val	06-Jun-23	10.73558
SW33.Val	06-Jun-23	10.7086
SW33.Val	06-Jun-23	10.68161
SW33.Val	07-Jun-23	10.65462
SW33.Val	07-Jun-23	10.62763
SW33.Val	07-Jun-23	10.60065
SW33.Val	07-Jun-23	10.57366
SW33.Val	07-Jun-23	10.54667
SW33.Val	07-Jun-23	10.51968
SW33.Val	07-Jun-23	10.4927
SW33.Val	07-Jun-23	10.46571
SW33.Val	07-Jun-23	10.43872
SW33.Val	07-Jun-23	10.41174
SW33.Val	08-Jun-23	10.38475
SW33.Val	08-Jun-23	10.35776
SW33.Val	08-Jun-23	10.33077
SW33.Val	08-Jun-23	10.30379
SW33.Val	08-Jun-23	10.2768
SW33.Val	08-Jun-23	10.24981
SW33.Val	08-Jun-23	10.22282
SW33.Val	08-Jun-23	10.19584
SW33.Val	08-Jun-23	10.16885
SW33.Val	09-Jun-23	10.14186
SW33.Val	09-Jun-23	10.11487
SW33.Val	09-Jun-23	10.08789
SW33.Val	09-Jun-23	10.0609
SW33.Val	09-Jun-23	10.03391
SW33.Val	09-Jun-23	10.00693

SW33.Val	09-Jun-23	16.42667
SW33.Val	09-Jun-23	15.09365
SW33.Val	09-Jun-23	16.95155
SW33.Val	09-Jun-23	17.02244
SW33.Val	10-Jun-23	15.54
SW33.Val	10-Jun-23	7.231196
SW33.Val	10-Jun-23	12.32525
SW33.Val	10-Jun-23	20.47333
SW33.Val	10-Jun-23	16.25989
SW33.Val	10-Jun-23	18.16222
SW33.Val	10-Jun-23	24.8189
SW33.Val	10-Jun-23	21
SW33.Val	10-Jun-23	14.13278
SW33.Val	10-Jun-23	14.325
SW33.Val	11-Jun-23	14.37249
SW33.Val	11-Jun-23	16.48409
SW33.Val	11-Jun-23	12.22556
SW33.Val	11-Jun-23	15.47289
SW33.Val	11-Jun-23	12.43695
SW33.Val	11-Jun-23	21.74687
SW33.Val	11-Jun-23	20.11074
SW33.Val	11-Jun-23	19.4525
SW33.Val	11-Jun-23	19
SW33.Val	11-Jun-23	16.538
SW33.Val	12-Jun-23	7.11562
SW33.Val	12-Jun-23	9.9625
SW33.Val	12-Jun-23	13.09076
SW33.Val	12-Jun-23	17.3625
SW33.Val	12-Jun-23	15.06359
SW33.Val	12-Jun-23	17
SW33.Val	12-Jun-23	14.85947
SW33.Val	12-Jun-23	21
SW33.Val	12-Jun-23	19.97257
SW33.Val	12-Jun-23	14.96992
SW33.Val	13-Jun-23	12.49373
SW33.Val	13-Jun-23	13.70854
SW33.Val	13-Jun-23	17.77344
SW33.Val	13-Jun-23	16.58382
SW33.Val	13-Jun-23	15.06047
SW33.Val	13-Jun-23	16.804
SW33.Val	13-Jun-23	19.57421
SW33.Val	13-Jun-23	21
SW33.Val	13-Jun-23	19
SW33.Val	13-Jun-23	14.16375
SW33.Val	14-Jun-23	16.43746
SW33.Val	14-Jun-23	15.03629
SW33.Val	14-Jun-23	10.67807
SW33.Val	14-Jun-23	12
SW33.Val	14-Jun-23	23.14375
SW33.Val	14-Jun-23	23.49541
SW33.Val	14-Jun-23	27.1462
SW33.Val	14-Jun-23	26
SW33.Val	14-Jun-23	18

SW33.Val	14-Jun-23	19.25454
SW33.Val	15-Jun-23	17.74333
SW33.Val	15-Jun-23	13.28556
SW33.Val	15-Jun-23	19.66416
SW33.Val	15-Jun-23	24.04904
SW33.Val	15-Jun-23	18
SW33.Val	15-Jun-23	23.08289
SW33.Val	15-Jun-23	23.71375
SW33.Val	15-Jun-23	26.17955
SW33.Val	15-Jun-23	19.97477
SW33.Val	16-Jun-23	18.27867
SW33.Val	16-Jun-23	16.88657
SW33.Val	16-Jun-23	14.07185
SW33.Val	16-Jun-23	20.45371
SW33.Val	16-Jun-23	19.47285
SW33.Val	16-Jun-23	19.515
SW33.Val	16-Jun-23	25.87167
SW33.Val	16-Jun-23	20.42917
SW33.Val	16-Jun-23	19.0783
SW33.Val	16-Jun-23	19.88667
SW33.Val	17-Jun-23	14.67132
SW33.Val	17-Jun-23	15.95694
SW33.Val	17-Jun-23	16.14784
SW33.Val	17-Jun-23	20.77167
SW33.Val	17-Jun-23	21.52873
SW33.Val	17-Jun-23	21.78111
SW33.Val	17-Jun-23	20.94042
SW33.Val	17-Jun-23	21.14302
SW33.Val	17-Jun-23	29.45712
SW33.Val	17-Jun-23	23.85833
SW33.Val	18-Jun-23	18.03
SW33.Val	18-Jun-23	19.25353
SW33.Val	18-Jun-23	18.07167
SW33.Val	18-Jun-23	20.38583
SW33.Val	18-Jun-23	18.57638
SW33.Val	18-Jun-23	19
SW33.Val	18-Jun-23	20.75118
SW33.Val	18-Jun-23	26.70333
SW33.Val	18-Jun-23	22.27469
SW33.Val	18-Jun-23	23.90333
SW33.Val	19-Jun-23	20.67335
SW33.Val	19-Jun-23	15.74707
SW33.Val	19-Jun-23	20
SW33.Val	19-Jun-23	19
SW33.Val	19-Jun-23	24.62568
SW33.Val	19-Jun-23	23.39028
SW33.Val	19-Jun-23	20.61443
SW33.Val	19-Jun-23	23.14583
SW33.Val	19-Jun-23	25.27047
SW33.Val	19-Jun-23	19.10693
SW33.Val	20-Jun-23	15.34167
SW33.Val	20-Jun-23	20.85417
SW33.Val	20-Jun-23	16.71667

SW33.Val	20-Jun-23	27.77277
SW33.Val	20-Jun-23	19.52917
SW33.Val	20-Jun-23	17.827
SW33.Val	20-Jun-23	22.56349
SW33.Val	20-Jun-23	23
SW33.Val	20-Jun-23	22.2709
SW33.Val	20-Jun-23	20.97083
SW33.Val	21-Jun-23	19.65333
SW33.Val	21-Jun-23	20.96247
SW33.Val	21-Jun-23	18
SW33.Val	21-Jun-23	25.62385
SW33.Val	21-Jun-23	23.57906
SW33.Val	21-Jun-23	16.4396
SW33.Val	21-Jun-23	23.12927
SW33.Val	21-Jun-23	28.4281
SW33.Val	21-Jun-23	28.54302
SW33.Val	21-Jun-23	23
SW33.Val	22-Jun-23	19.67165
SW33.Val	22-Jun-23	22.225
SW33.Val	22-Jun-23	19.07023
SW33.Val	22-Jun-23	24.61484
SW33.Val	22-Jun-23	26.64722
SW33.Val	22-Jun-23	21.78056
SW33.Val	22-Jun-23	24.64583
SW33.Val	22-Jun-23	27
SW33.Val	22-Jun-23	22.54
SW33.Val	23-Jun-23	24
SW33.Val	23-Jun-23	22.18125
SW33.Val	23-Jun-23	21.48
SW33.Val	23-Jun-23	23.82478
SW33.Val	23-Jun-23	20.84821
SW33.Val	23-Jun-23	16.2055
SW33.Val	23-Jun-23	15.78288
SW33.Val	23-Jun-23	18.12782
SW33.Val	23-Jun-23	22.71715
SW33.Val	23-Jun-23	27.17603
SW33.Val	24-Jun-23	21.52329
SW33.Val	24-Jun-23	21.30225
SW33.Val	24-Jun-23	19.18719
SW33.Val	24-Jun-23	24
SW33.Val	24-Jun-23	17.61468
SW33.Val	24-Jun-23	19.14678
SW33.Val	24-Jun-23	16.16917
SW33.Val	24-Jun-23	22.74707
SW33.Val	24-Jun-23	26
SW33.Val	24-Jun-23	22.24341
SW33.Val	25-Jun-23	24
SW33.Val	25-Jun-23	24
SW33.Val	25-Jun-23	19.37167
SW33.Val	25-Jun-23	23.07149
SW33.Val	25-Jun-23	18.32618
SW33.Val	25-Jun-23	18.16209
SW33.Val	25-Jun-23	20.72305

SW33.Val	25-Jun-23	20
SW33.Val	25-Jun-23	22.71542
SW33.Val	25-Jun-23	19.82444
SW33.Val	26-Jun-23	23
SW33.Val	26-Jun-23	22.35406
SW33.Val	26-Jun-23	19.68581
SW33.Val	26-Jun-23	22.14321
SW33.Val	26-Jun-23	18.54414
SW33.Val	26-Jun-23	15.595
SW33.Val	26-Jun-23	17
SW33.Val	26-Jun-23	15.52667
SW33.Val	26-Jun-23	17.86048
SW33.Val	26-Jun-23	16.91667
SW33.Val	27-Jun-23	15.58438
SW33.Val	27-Jun-23	14.38794
SW33.Val	27-Jun-23	17.52297
SW33.Val	27-Jun-23	22.06845
SW33.Val	27-Jun-23	14.15657
SW33.Val	27-Jun-23	18.05333
SW33.Val	27-Jun-23	16.21908
SW33.Val	27-Jun-23	16.34167
SW33.Val	27-Jun-23	18.43214
SW33.Val	27-Jun-23	21.53634
SW33.Val	28-Jun-23	17.35428
SW33.Val	28-Jun-23	12.66165
SW33.Val	28-Jun-23	15.1025
SW33.Val	28-Jun-23	19.64304
SW33.Val	28-Jun-23	12.76814
SW33.Val	28-Jun-23	10.28894
SW33.Val	28-Jun-23	17.70333
SW33.Val	28-Jun-23	17.1614
SW33.Val	28-Jun-23	17.35179
SW33.Val	28-Jun-23	11.07268
SW33.Val	29-Jun-23	19.98375
SW33.Val	29-Jun-23	15
SW33.Val	29-Jun-23	20
SW33.Val	29-Jun-23	16.07018
SW33.Val	29-Jun-23	17.42402
SW33.Val	29-Jun-23	11.51043
SW33.Val	29-Jun-23	15.91427
SW33.Val	29-Jun-23	13.43428
SW33.Val	29-Jun-23	18
SW33.Val	29-Jun-23	12.8
SW33.Val	30-Jun-23	19.92282
SW33.Val	30-Jun-23	17.34333
SW33.Val	30-Jun-23	16.31542
SW33.Val	30-Jun-23	16.06925
SW33.Val	30-Jun-23	13.77109
SW33.Val	30-Jun-23	16.76667
SW33.Val	30-Jun-23	18.19048
SW33.Val	30-Jun-23	13.06667
SW33.Val	30-Jun-23	15.60283
SW33.Val	01-Jul-23	12.79933

SW33.Val	01-Jul-23	9.05
SW33.Val	01-Jul-23	14.66667
SW33.Val	01-Jul-23	16.10474
SW33.Val	01-Jul-23	16.24
SW33.Val	01-Jul-23	15.53411
SW33.Val	01-Jul-23	17.50458
SW33.Val	01-Jul-23	18.33805
SW33.Val	01-Jul-23	12.73623
SW33.Val	01-Jul-23	10.29682
SW33.Val	02-Jul-23	14.26711
SW33.Val	02-Jul-23	12.61667
SW33.Val	02-Jul-23	13
SW33.Val	02-Jul-23	15.73649
SW33.Val	02-Jul-23	16.1
SW33.Val	02-Jul-23	14.08333
SW33.Val	02-Jul-23	20.46912
SW33.Val	02-Jul-23	16
SW33.Val	02-Jul-23	18.37628
SW33.Val	02-Jul-23	13.5759
SW33.Val	03-Jul-23	13.46711
SW33.Val	03-Jul-23	12.01665
SW33.Val	03-Jul-23	18
SW33.Val	03-Jul-23	18.36926
SW33.Val	03-Jul-23	16.06816
SW33.Val	03-Jul-23	19.7025
SW33.Val	03-Jul-23	24.53417
SW33.Val	03-Jul-23	24.33722
SW33.Val	03-Jul-23	26.86833
SW33.Val	03-Jul-23	29.03809
SW33.Val	04-Jul-23	23.26822
SW33.Val	04-Jul-23	22.51583
SW33.Val	04-Jul-23	22.1691
SW33.Val	04-Jul-23	17.61216
SW33.Val	04-Jul-23	14.6675
SW33.Val	04-Jul-23	13.76562
SW33.Val	04-Jul-23	17
SW33.Val	04-Jul-23	42
SW33.Val	04-Jul-23	35.46867
SW33.Val	04-Jul-23	102.74
SW33.Val	05-Jul-23	56.65664
SW33.Val	05-Jul-23	36.93017
SW33.Val	05-Jul-23	35
SW33.Val	05-Jul-23	24.905
SW33.Val	05-Jul-23	24.08993
SW33.Val	05-Jul-23	28.07
SW33.Val	05-Jul-23	6.050658
SW33.Val	05-Jul-23	17.825
SW33.Val	05-Jul-23	22
SW33.Val	05-Jul-23	13.85238
SW33.Val	06-Jul-23	6.4275
SW33.Val	06-Jul-23	-27.6819
SW33.Val	06-Jul-23	-6.45583
SW33.Val	06-Jul-23	11.36759

SW33.Val	06-Jul-23	11.64489
SW33.Val	06-Jul-23	13.76725
SW33.Val	06-Jul-23	13.53467
SW33.Val	06-Jul-23	17.49373
SW33.Val	06-Jul-23	18
SW33.Val	06-Jul-23	19
SW33.Val	07-Jul-23	18.73579
SW33.Val	07-Jul-23	3.825397
SW33.Val	07-Jul-23	13
SW33.Val	07-Jul-23	16.78806
SW33.Val	07-Jul-23	17.93344
SW33.Val	07-Jul-23	21
SW33.Val	07-Jul-23	17.85512
SW33.Val	07-Jul-23	11.4812
SW33.Val	07-Jul-23	16
SW33.Val	08-Jul-23	10.8459
SW33.Val	08-Jul-23	8.475
SW33.Val	08-Jul-23	12.25083
SW33.Val	08-Jul-23	12.665
SW33.Val	08-Jul-23	18.90909
SW33.Val	08-Jul-23	10.1925
SW33.Val	08-Jul-23	15.3466
SW33.Val	08-Jul-23	14.70078
SW33.Val	08-Jul-23	13.99334
SW33.Val	08-Jul-23	13.59352
SW33.Val	09-Jul-23	14
SW33.Val	09-Jul-23	10.30167
SW33.Val	09-Jul-23	9.465833
SW33.Val	09-Jul-23	22.015
SW33.Val	09-Jul-23	20.63413
SW33.Val	09-Jul-23	9.733333
SW33.Val	09-Jul-23	23
SW33.Val	09-Jul-23	17.71333
SW33.Val	09-Jul-23	14.83333
SW33.Val	09-Jul-23	18.45667
SW33.Val	10-Jul-23	5.269103
SW33.Val	10-Jul-23	13.94333
SW33.Val	10-Jul-23	24.83507
SW33.Val	10-Jul-23	23.68197
SW33.Val	10-Jul-23	17.27016
SW33.Val	10-Jul-23	9.492496
SW33.Val	10-Jul-23	20.58794
SW33.Val	10-Jul-23	26
SW33.Val	10-Jul-23	27.16333
SW33.Val	10-Jul-23	13.59102
SW33.Val	11-Jul-23	16
SW33.Val	11-Jul-23	10.6711
SW33.Val	11-Jul-23	18.8925
SW33.Val	11-Jul-23	27.66667
SW33.Val	11-Jul-23	15.29177
SW33.Val	11-Jul-23	16.19
SW33.Val	11-Jul-23	17
SW33.Val	11-Jul-23	24.65833

SW33.Val	11-Jul-23	15
SW33.Val	11-Jul-23	18.22333
SW33.Val	12-Jul-23	3.353333
SW33.Val	12-Jul-23	21.26333
SW33.Val	12-Jul-23	14.96333
SW33.Val	12-Jul-23	23.67001
SW33.Val	12-Jul-23	20.36333
SW33.Val	12-Jul-23	19.405
SW33.Val	12-Jul-23	18.23667
SW33.Val	12-Jul-23	23.68333
SW33.Val	12-Jul-23	21.16333
SW33.Val	12-Jul-23	18.45333
SW33.Val	13-Jul-23	17.17789
SW33.Val	13-Jul-23	10.10667
SW33.Val	13-Jul-23	12
SW33.Val	13-Jul-23	22.30667
SW33.Val	13-Jul-23	20.63484
SW33.Val	13-Jul-23	21.74667
SW33.Val	13-Jul-23	24.42
SW33.Val	13-Jul-23	23.38222
SW33.Val	13-Jul-23	11.50746
SW33.Val	13-Jul-23	15
SW33.Val	14-Jul-23	14.3186
SW33.Val	14-Jul-23	10.73667
SW33.Val	14-Jul-23	15.07018
SW33.Val	14-Jul-23	15.36379
SW33.Val	14-Jul-23	19.45432
SW33.Val	14-Jul-23	20.93667
SW33.Val	14-Jul-23	18.76333
SW33.Val	14-Jul-23	19
SW33.Val	14-Jul-23	15.65
SW33.Val	15-Jul-23	18.53533
SW33.Val	15-Jul-23	16.1875
SW33.Val	15-Jul-23	7
SW33.Val	15-Jul-23	7.299252
SW33.Val	15-Jul-23	11.6875
SW33.Val	15-Jul-23	13.0875
SW33.Val	15-Jul-23	12.53731
SW33.Val	15-Jul-23	11.7625
SW33.Val	15-Jul-23	13.53634
SW33.Val	15-Jul-23	11.93858
SW33.Val	16-Jul-23	4.075
SW33.Val	16-Jul-23	9.189324
SW33.Val	16-Jul-23	6.157895
SW33.Val	16-Jul-23	13.965
SW33.Val	16-Jul-23	9.675
SW33.Val	16-Jul-23	15.91
SW33.Val	16-Jul-23	15
SW33.Val	16-Jul-23	22.625
SW33.Val	16-Jul-23	21.46205
SW33.Val	16-Jul-23	19.325
SW33.Val	17-Jul-23	21.46689
SW33.Val	17-Jul-23	20.5625

SW33.Val	17-Jul-23	20
SW33.Val	17-Jul-23	17.96488
SW33.Val	17-Jul-23	16
SW33.Val	17-Jul-23	13.085
SW33.Val	17-Jul-23	19.9075
SW33.Val	17-Jul-23	19.38083
SW33.Val	17-Jul-23	22
SW33.Val	17-Jul-23	17.65667
SW33.Val	18-Jul-23	22
SW33.Val	18-Jul-23	14.5624
SW33.Val	18-Jul-23	13.785
SW33.Val	18-Jul-23	16.96167
SW33.Val	18-Jul-23	12.66945
SW33.Val	18-Jul-23	11.44667
SW33.Val	18-Jul-23	18.67997
SW33.Val	18-Jul-23	20
SW33.Val	18-Jul-23	21.53917
SW33.Val	18-Jul-23	18
SW33.Val	19-Jul-23	14.13701
SW33.Val	19-Jul-23	12.24333
SW33.Val	19-Jul-23	11.73917
SW33.Val	19-Jul-23	13.1175
SW33.Val	19-Jul-23	17.035
SW33.Val	19-Jul-23	17.09273
SW33.Val	19-Jul-23	15.09136
SW33.Val	19-Jul-23	18.94904
SW33.Val	19-Jul-23	1.536929
SW33.Val	19-Jul-23	9.174274
SW33.Val	20-Jul-23	16.4175
SW33.Val	20-Jul-23	5.750833
SW33.Val	20-Jul-23	20.3475
SW33.Val	20-Jul-23	20.80017
SW33.Val	20-Jul-23	15.99246
SW33.Val	20-Jul-23	13.90954
SW33.Val	20-Jul-23	14
SW33.Val	20-Jul-23	23
SW33.Val	20-Jul-23	23.92436
SW33.Val	20-Jul-23	23.67991
SW33.Val	21-Jul-23	21.13667
SW33.Val	21-Jul-23	16.75667
SW33.Val	21-Jul-23	20
SW33.Val	21-Jul-23	22.76539
SW33.Val	21-Jul-23	14.96241
SW33.Val	21-Jul-23	15.2673
SW33.Val	21-Jul-23	12.06
SW33.Val	21-Jul-23	17.2
SW33.Val	21-Jul-23	18.92077
SW33.Val	22-Jul-23	12.90363
SW33.Val	22-Jul-23	15.30087
SW33.Val	22-Jul-23	15.88
SW33.Val	22-Jul-23	14.18
SW33.Val	22-Jul-23	17.92
SW33.Val	22-Jul-23	14

SW33.Val	22-Jul-23	19.96
SW33.Val	22-Jul-23	19
SW33.Val	22-Jul-23	18.76
SW33.Val	22-Jul-23	18.54045
SW33.Val	23-Jul-23	14
SW33.Val	23-Jul-23	15.71977
SW33.Val	23-Jul-23	11.2
SW33.Val	23-Jul-23	17.68159
SW33.Val	23-Jul-23	10.2
SW33.Val	23-Jul-23	9.375
SW33.Val	23-Jul-23	15.365
SW33.Val	23-Jul-23	15
SW33.Val	23-Jul-23	17.799
SW33.Val	23-Jul-23	7.76808
SW33.Val	24-Jul-23	10.32
SW33.Val	24-Jul-23	19.86
SW33.Val	24-Jul-23	23.11833
SW33.Val	24-Jul-23	16.07506
SW33.Val	24-Jul-23	18.7606
SW33.Val	24-Jul-23	15.32
SW33.Val	24-Jul-23	24.84
SW33.Val	24-Jul-23	39.11176
SW33.Val	24-Jul-23	35.48167
SW33.Val	24-Jul-23	22.46933
SW33.Val	25-Jul-23	37.63667
SW33.Val	25-Jul-23	25.4225
SW33.Val	25-Jul-23	25.37656
SW33.Val	25-Jul-23	7.036667
SW33.Val	25-Jul-23	8.795833
SW33.Val	25-Jul-23	-44.5017
SW33.Val	25-Jul-23	-22.7258
SW33.Val	25-Jul-23	4.791667
SW33.Val	25-Jul-23	-50.7169
SW33.Val	25-Jul-23	-1.01671
SW33.Val	26-Jul-23	-16.7717
SW33.Val	26-Jul-23	4.452123
SW33.Val	26-Jul-23	-4
SW33.Val	26-Jul-23	3.741451
SW33.Val	26-Jul-23	17
SW33.Val	26-Jul-23	1.728941
SW33.Val	26-Jul-23	12.35917
SW33.Val	26-Jul-23	-1.40833
SW33.Val	26-Jul-23	-36.7174
SW33.Val	26-Jul-23	2.295833
SW33.Val	27-Jul-23	-43.7025
SW33.Val	27-Jul-23	12.8875
SW33.Val	27-Jul-23	-2.94078
SW33.Val	27-Jul-23	-20.4943
SW33.Val	27-Jul-23	12.6325
SW33.Val	27-Jul-23	3.695906
SW33.Val	27-Jul-23	16.71726
SW33.Val	27-Jul-23	10.36877
SW33.Val	27-Jul-23	14.51667

SW33.Val	27-Jul-23	14
SW33.Val	28-Jul-23	7.525
SW33.Val	28-Jul-23	-17.9708
SW33.Val	28-Jul-23	-8.925
SW33.Val	28-Jul-23	10.58981
SW33.Val	28-Jul-23	6.083126
SW33.Val	28-Jul-23	8.659185
SW33.Val	28-Jul-23	10.0782
SW33.Val	28-Jul-23	13.24273
SW33.Val	28-Jul-23	15.93333
SW33.Val	28-Jul-23	7.708333
SW33.Val	29-Jul-23	14.35827
SW33.Val	29-Jul-23	1.09182
SW33.Val	29-Jul-23	17.43972
SW33.Val	29-Jul-23	6.722269
SW33.Val	29-Jul-23	2.125
SW33.Val	29-Jul-23	7.441667
SW33.Val	29-Jul-23	14.28333
SW33.Val	29-Jul-23	11.88333
SW33.Val	29-Jul-23	18
SW33.Val	30-Jul-23	3.208333
SW33.Val	30-Jul-23	-3.6786
SW33.Val	30-Jul-23	-74.6922
SW33.Val	30-Jul-23	13.21134
SW33.Val	30-Jul-23	9.330827
SW33.Val	30-Jul-23	8
SW33.Val	30-Jul-23	13.3425
SW33.Val	30-Jul-23	17.57
SW33.Val	30-Jul-23	17
SW33.Val	30-Jul-23	15.20948
SW33.Val	31-Jul-23	8.714762
SW33.Val	31-Jul-23	7.894737
SW33.Val	31-Jul-23	-108.473
SW33.Val	31-Jul-23	16.77
SW33.Val	31-Jul-23	6.12
SW33.Val	31-Jul-23	10.745
SW33.Val	31-Jul-23	17.64
SW33.Val	31-Jul-23	19.6425
SW33.Val	31-Jul-23	18.1725
SW33.Val	31-Jul-23	16.7875
SW33.Val	01-Aug-23	7.078652
SW33.Val	01-Aug-23	15.04239
SW33.Val	01-Aug-23	-35.1754
SW33.Val	01-Aug-23	21.34221
SW33.Val	01-Aug-23	15.77638
SW33.Val	01-Aug-23	9.919799
SW33.Val	01-Aug-23	12.37
SW33.Val	01-Aug-23	22.76222
SW33.Val	01-Aug-23	21.88667
SW33.Val	01-Aug-23	20.27
SW33.Val	02-Aug-23	19
SW33.Val	02-Aug-23	17.84083
SW33.Val	02-Aug-23	11.12949

SW33.Val	02-Aug-23	19.34
SW33.Val	02-Aug-23	19.94667
SW33.Val	02-Aug-23	309.6761
SW33.Val	02-Aug-23	191.3567
SW33.Val	02-Aug-23	52.93317
SW33.Val	02-Aug-23	30.05799
SW33.Val	02-Aug-23	13.36515
SW33.Val	03-Aug-23	18.45872
SW33.Val	03-Aug-23	21.06187
SW33.Val	03-Aug-23	13.28667
SW33.Val	03-Aug-23	14
SW33.Val	03-Aug-23	9.965919
SW33.Val	03-Aug-23	3.216667
SW33.Val	03-Aug-23	14
SW33.Val	03-Aug-23	17.64333
SW33.Val	03-Aug-23	19.7169
SW33.Val	03-Aug-23	17.27
SW33.Val	04-Aug-23	16.09056
SW33.Val	04-Aug-23	17.30722
SW33.Val	04-Aug-23	9.86
SW33.Val	04-Aug-23	17.835
SW33.Val	04-Aug-23	5.102244
SW33.Val	04-Aug-23	21.42869
SW33.Val	04-Aug-23	20.59684
SW33.Val	04-Aug-23	18
SW33.Val	04-Aug-23	18.77667
SW33.Val	04-Aug-23	18.48833
SW33.Val	05-Aug-23	7.353333
SW33.Val	05-Aug-23	19.75021
SW33.Val	05-Aug-23	13.57667
SW33.Val	05-Aug-23	15.70389
SW33.Val	05-Aug-23	7.711554
SW33.Val	05-Aug-23	10.23638
SW33.Val	05-Aug-23	19.34417
SW33.Val	05-Aug-23	16.865
SW33.Val	05-Aug-23	19.05597
SW33.Val	06-Aug-23	16.7552
SW33.Val	06-Aug-23	8.568106
SW33.Val	06-Aug-23	16.77917
SW33.Val	06-Aug-23	20.14488
SW33.Val	06-Aug-23	18.99169
SW33.Val	06-Aug-23	14.97667
SW33.Val	06-Aug-23	19.17667
SW33.Val	06-Aug-23	19
SW33.Val	06-Aug-23	22
SW33.Val	06-Aug-23	19.385
SW33.Val	07-Aug-23	20
SW33.Val	07-Aug-23	15.175
SW33.Val	07-Aug-23	15.76
SW33.Val	07-Aug-23	19.275
SW33.Val	07-Aug-23	18
SW33.Val	07-Aug-23	14.76884
SW33.Val	07-Aug-23	17.8725

SW33.Val	07-Aug-23	20.345
SW33.Val	07-Aug-23	20.93411
SW33.Val	07-Aug-23	9.55
SW33.Val	08-Aug-23	16
SW33.Val	08-Aug-23	14.26316
SW33.Val	08-Aug-23	17.07423
SW33.Val	08-Aug-23	18.8625
SW33.Val	08-Aug-23	12.88
SW33.Val	08-Aug-23	15.765
SW33.Val	08-Aug-23	18
SW33.Val	08-Aug-23	19
SW33.Val	08-Aug-23	21.355
SW33.Val	08-Aug-23	14.21667
SW33.Val	09-Aug-23	11.225
SW33.Val	09-Aug-23	12.99917
SW33.Val	09-Aug-23	17.07077
SW33.Val	09-Aug-23	23.13
SW33.Val	09-Aug-23	18.0125
SW33.Val	09-Aug-23	14
SW33.Val	09-Aug-23	22.73935
SW33.Val	09-Aug-23	20.34583
SW33.Val	09-Aug-23	20.64583
SW33.Val	09-Aug-23	19.05417
SW33.Val	10-Aug-23	15
SW33.Val	10-Aug-23	16.81667
SW33.Val	10-Aug-23	20.075
SW33.Val	10-Aug-23	13
SW33.Val	10-Aug-23	11.89241
SW33.Val	10-Aug-23	17.74583
SW33.Val	10-Aug-23	16.09174
SW33.Val	10-Aug-23	22.9625
SW33.Val	10-Aug-23	25.35387
SW33.Val	10-Aug-23	19.97292
SW33.Val	11-Aug-23	21.24478
SW33.Val	11-Aug-23	11.62667
SW33.Val	11-Aug-23	13.88542
SW33.Val	11-Aug-23	19.85441
SW33.Val	11-Aug-23	10.44621
SW33.Val	11-Aug-23	17.2381
SW33.Val	11-Aug-23	17
SW33.Val	11-Aug-23	22.34635
SW33.Val	11-Aug-23	25.41472
SW33.Val	11-Aug-23	19.13333
SW33.Val	12-Aug-23	16.23333
SW33.Val	12-Aug-23	15.46667
SW33.Val	12-Aug-23	19.77333
SW33.Val	12-Aug-23	18.24577
SW33.Val	12-Aug-23	17.67013
SW33.Val	12-Aug-23	17.22814
SW33.Val	12-Aug-23	19.9069
SW33.Val	12-Aug-23	21.3475
SW33.Val	12-Aug-23	23
SW33.Val	13-Aug-23	19.64917

SW33.Val	13-Aug-23	16.23441
SW33.Val	13-Aug-23	16
SW33.Val	13-Aug-23	19.38796
SW33.Val	13-Aug-23	23.115
SW33.Val	13-Aug-23	17.75875
SW33.Val	13-Aug-23	18.505
SW33.Val	13-Aug-23	17.04355
SW33.Val	13-Aug-23	17.3475
SW33.Val	13-Aug-23	15.705
SW33.Val	14-Aug-23	16
SW33.Val	14-Aug-23	16.73684
SW33.Val	14-Aug-23	16
SW33.Val	14-Aug-23	20.0774
SW33.Val	14-Aug-23	12.8525
SW33.Val	14-Aug-23	13.76596
SW33.Val	14-Aug-23	13.25343
SW33.Val	14-Aug-23	14.04754
SW33.Val	14-Aug-23	18
SW33.Val	14-Aug-23	19.64833
SW33.Val	15-Aug-23	15.94583
SW33.Val	15-Aug-23	15.66916
SW33.Val	15-Aug-23	14.09121
SW33.Val	15-Aug-23	20.24167
SW33.Val	15-Aug-23	13.92583
SW33.Val	15-Aug-23	14.55167
SW33.Val	15-Aug-23	18.62656
SW33.Val	15-Aug-23	19
SW33.Val	15-Aug-23	17
SW33.Val	15-Aug-23	19.29667
SW33.Val	16-Aug-23	16.63375
SW33.Val	16-Aug-23	16.60902
SW33.Val	16-Aug-23	15
SW33.Val	16-Aug-23	15.7577
SW33.Val	16-Aug-23	8.979592
SW33.Val	16-Aug-23	18.20667
SW33.Val	16-Aug-23	18.49667
SW33.Val	16-Aug-23	20.295
SW33.Val	16-Aug-23	25.39667
SW33.Val	16-Aug-23	21.35083
SW33.Val	17-Aug-23	21
SW33.Val	17-Aug-23	23.24917
SW33.Val	17-Aug-23	17.19667
SW33.Val	17-Aug-23	20.4525
SW33.Val	17-Aug-23	10.40482
SW33.Val	17-Aug-23	15.77537
SW33.Val	17-Aug-23	16.26351
SW33.Val	17-Aug-23	21
SW33.Val	17-Aug-23	21
SW33.Val	17-Aug-23	22.59667
SW33.Val	18-Aug-23	24
SW33.Val	18-Aug-23	21.25
SW33.Val	18-Aug-23	19.55
SW33.Val	18-Aug-23	21.53731

SW33.Val	18-Aug-23	18.2793
SW33.Val	18-Aug-23	7.696013
SW33.Val	18-Aug-23	11.83375
SW33.Val	18-Aug-23	21
SW33.Val	18-Aug-23	22
SW33.Val	18-Aug-23	19.95983
SW33.Val	19-Aug-23	20
SW33.Val	19-Aug-23	16.24938
SW33.Val	19-Aug-23	18.4525
SW33.Val	19-Aug-23	21
SW33.Val	19-Aug-23	19.39967
SW33.Val	19-Aug-23	10.81674
SW33.Val	19-Aug-23	15.75083
SW33.Val	19-Aug-23	13.84788
SW33.Val	19-Aug-23	11.30486
SW33.Val	19-Aug-23	12.69804
SW33.Val	20-Aug-23	10.95083
SW33.Val	20-Aug-23	10.50167
SW33.Val	20-Aug-23	12.64706
SW33.Val	20-Aug-23	20.74583
SW33.Val	20-Aug-23	11.60183
SW33.Val	20-Aug-23	9.724728
SW33.Val	20-Aug-23	16.99171
SW33.Val	20-Aug-23	17.05083
SW33.Val	20-Aug-23	11.699
SW33.Val	21-Aug-23	12.75461
SW33.Val	21-Aug-23	18.04917
SW33.Val	21-Aug-23	8.743226
SW33.Val	21-Aug-23	18.10167
SW33.Val	21-Aug-23	13.04941
SW33.Val	21-Aug-23	9.148333
SW33.Val	21-Aug-23	11.49457
SW33.Val	21-Aug-23	18.50083
SW33.Val	21-Aug-23	22.05162
SW33.Val	21-Aug-23	18.34992
SW33.Val	22-Aug-23	17.30333
SW33.Val	22-Aug-23	19.74647
SW33.Val	22-Aug-23	16.00667
SW33.Val	22-Aug-23	22.89667
SW33.Val	22-Aug-23	14.59383
SW33.Val	22-Aug-23	9.748328
SW33.Val	22-Aug-23	11.29
SW33.Val	22-Aug-23	17.75229
SW33.Val	22-Aug-23	24.94833
SW33.Val	22-Aug-23	23.3525
SW33.Val	23-Aug-23	17.8126
SW33.Val	23-Aug-23	8.434638
SW33.Val	23-Aug-23	13.00667
SW33.Val	23-Aug-23	22.345
SW33.Val	23-Aug-23	16
SW33.Val	23-Aug-23	11.62864
SW33.Val	23-Aug-23	12.45
SW33.Val	23-Aug-23	14.74813

SW33.Val	23-Aug-23	16
SW33.Val	23-Aug-23	18.64696
SW33.Val	24-Aug-23	18.04087
SW33.Val	24-Aug-23	10.71977
SW33.Val	24-Aug-23	14.49164
SW33.Val	24-Aug-23	19.42369
SW33.Val	24-Aug-23	18.1475
SW33.Val	24-Aug-23	7.459617
SW33.Val	24-Aug-23	13.45159
SW33.Val	24-Aug-23	19.75251
SW33.Val	24-Aug-23	22
SW33.Val	24-Aug-23	9.593333
SW33.Val	25-Aug-23	12.10474
SW33.Val	25-Aug-23	14.81333
SW33.Val	25-Aug-23	21.24561
SW33.Val	25-Aug-23	21.44667
SW33.Val	25-Aug-23	11.48667
SW33.Val	25-Aug-23	5.435556
SW33.Val	25-Aug-23	18.62667
SW33.Val	25-Aug-23	19.73938
SW33.Val	25-Aug-23	16.27061
SW33.Val	25-Aug-23	17.06
SW33.Val	26-Aug-23	16.69493
SW33.Val	26-Aug-23	14.09174
SW33.Val	26-Aug-23	17.01333
SW33.Val	26-Aug-23	18.12667
SW33.Val	26-Aug-23	7.112769
SW33.Val	26-Aug-23	18.38542
SW33.Val	26-Aug-23	21.81667
SW33.Val	26-Aug-23	30.24583
SW33.Val	26-Aug-23	24.21685
SW33.Val	26-Aug-23	21.41785
SW33.Val	27-Aug-23	17.20556
SW33.Val	27-Aug-23	18.09405
SW33.Val	27-Aug-23	20.76246
SW33.Val	27-Aug-23	17.89092
SW33.Val	27-Aug-23	17.86817
SW33.Val	27-Aug-23	8.631579
SW33.Val	27-Aug-23	22.09619
SW33.Val	27-Aug-23	26
SW33.Val	27-Aug-23	18.0275
SW33.Val	28-Aug-23	14.645
SW33.Val	28-Aug-23	11.74185
SW33.Val	28-Aug-23	10.09023
SW33.Val	28-Aug-23	17.01746
SW33.Val	28-Aug-23	15.4475
SW33.Val	28-Aug-23	14.29
SW33.Val	28-Aug-23	16.5638
SW33.Val	28-Aug-23	21.3609
SW33.Val	28-Aug-23	22.245
SW33.Val	28-Aug-23	13.77685
SW33.Val	29-Aug-23	15
SW33.Val	29-Aug-23	17.275

SW33.Val	29-Aug-23	13.55112
SW33.Val	29-Aug-23	20.74479
SW33.Val	29-Aug-23	20.55537
SW33.Val	29-Aug-23	11.21362
SW33.Val	29-Aug-23	20.1557
SW33.Val	29-Aug-23	26.725
SW33.Val	29-Aug-23	17.75583
SW33.Val	29-Aug-23	17.4975
SW33.Val	30-Aug-23	18.22083
SW33.Val	30-Aug-23	15.21417
SW33.Val	30-Aug-23	10
SW33.Val	30-Aug-23	21.2325
SW33.Val	30-Aug-23	18.16625
SW33.Val	30-Aug-23	14.85405
SW33.Val	30-Aug-23	20.07692
SW33.Val	30-Aug-23	28.54417
SW33.Val	30-Aug-23	32
SW33.Val	30-Aug-23	24.94417
SW33.Val	31-Aug-23	22.78065
SW33.Val	31-Aug-23	18.9025
SW33.Val	31-Aug-23	8.309167
SW33.Val	31-Aug-23	23
SW33.Val	31-Aug-23	15.57743
SW33.Val	31-Aug-23	17.14333
SW33.Val	31-Aug-23	19.54059
SW33.Val	31-Aug-23	23.08667
SW33.Val	31-Aug-23	23.525
SW33.Val	31-Aug-23	24
SW33.Val	01-Sep-23	19.67749
SW33.Val	01-Sep-23	19.65494
SW33.Val	01-Sep-23	20
SW33.Val	01-Sep-23	17.23
SW33.Val	01-Sep-23	16.89443
SW33.Val	01-Sep-23	9.998333
SW33.Val	01-Sep-23	10
SW33.Val	01-Sep-23	15
SW33.Val	01-Sep-23	16.97577
SW33.Val	01-Sep-23	17.11343
SW33.Val	02-Sep-23	20
SW33.Val	02-Sep-23	12.38423
SW33.Val	02-Sep-23	11.43442
SW33.Val	02-Sep-23	20.43275
SW33.Val	02-Sep-23	7.228143
SW33.Val	02-Sep-23	6.85625
SW33.Val	02-Sep-23	13.465
SW33.Val	02-Sep-23	18.45477
SW33.Val	02-Sep-23	22.02496
SW33.Val	02-Sep-23	19.9425
SW33.Val	03-Sep-23	18.6422
SW33.Val	03-Sep-23	18.0275
SW33.Val	03-Sep-23	18
SW33.Val	03-Sep-23	9.03
SW33.Val	03-Sep-23	4

SW33.Val	03-Sep-23	8.429167
SW33.Val	03-Sep-23	14.73625
SW33.Val	03-Sep-23	17.45788
SW33.Val	03-Sep-23	18
SW33.Val	04-Sep-23	18.16792
SW33.Val	04-Sep-23	17.64167
SW33.Val	04-Sep-23	18.28761
SW33.Val	04-Sep-23	23.82377
SW33.Val	04-Sep-23	14.0358
SW33.Val	04-Sep-23	14.675
SW33.Val	04-Sep-23	10.85406
SW33.Val	04-Sep-23	21.15833
SW33.Val	04-Sep-23	23
SW33.Val	04-Sep-23	23.75833
SW33.Val	05-Sep-23	24
SW33.Val	05-Sep-23	24.64083
SW33.Val	05-Sep-23	23.34083
SW33.Val	05-Sep-23	24
SW33.Val	05-Sep-23	16.2225
SW33.Val	05-Sep-23	12.55917
SW33.Val	05-Sep-23	11.5775
SW33.Val	05-Sep-23	17.15917
SW33.Val	05-Sep-23	23
SW33.Val	05-Sep-23	22.30994
SW33.Val	06-Sep-23	18.21776
SW33.Val	06-Sep-23	23
SW33.Val	06-Sep-23	21.34035
SW33.Val	06-Sep-23	15.03062
SW33.Val	06-Sep-23	14.7
SW33.Val	06-Sep-23	14.12073
SW33.Val	06-Sep-23	16
SW33.Val	06-Sep-23	22.46734
SW33.Val	06-Sep-23	17.69967
SW33.Val	06-Sep-23	18.24
SW33.Val	07-Sep-23	9.299252
SW33.Val	07-Sep-23	15.49626
SW33.Val	07-Sep-23	17.64
SW33.Val	07-Sep-23	26.86567
SW33.Val	07-Sep-23	12.37
SW33.Val	07-Sep-23	14.56
SW33.Val	07-Sep-23	19
SW33.Val	07-Sep-23	23.6808
SW33.Val	07-Sep-23	25.16
SW33.Val	07-Sep-23	23
SW33.Val	08-Sep-23	21.90875
SW33.Val	08-Sep-23	18.80417
SW33.Val	08-Sep-23	19
SW33.Val	08-Sep-23	17.03917
SW33.Val	08-Sep-23	14.2175
SW33.Val	08-Sep-23	10.51854
SW33.Val	08-Sep-23	19.59767
SW33.Val	08-Sep-23	24.15833
SW33.Val	08-Sep-23	100.194

SW33.Val	08-Sep-23	3.845896
SW33.Val	09-Sep-23	9
SW33.Val	09-Sep-23	7.358159
SW33.Val	09-Sep-23	10.33889
SW33.Val	09-Sep-23	6.076667
SW33.Val	09-Sep-23	5.738333
SW33.Val	09-Sep-23	2.8425
SW33.Val	09-Sep-23	6.8625
SW33.Val	09-Sep-23	9
SW33.Val	09-Sep-23	10
SW33.Val	09-Sep-23	12.23833
SW33.Val	10-Sep-23	8.875415
SW33.Val	10-Sep-23	9
SW33.Val	10-Sep-23	6.661667
SW33.Val	10-Sep-23	3.076667
SW33.Val	10-Sep-23	5.518333
SW33.Val	10-Sep-23	-1.87958
SW33.Val	10-Sep-23	6.6934
SW33.Val	10-Sep-23	15
SW33.Val	10-Sep-23	10
SW33.Val	10-Sep-23	12
SW33.Val	11-Sep-23	10
SW33.Val	11-Sep-23	8.275
SW33.Val	11-Sep-23	11.675
SW33.Val	11-Sep-23	12.90625
SW33.Val	11-Sep-23	4.704946
SW33.Val	11-Sep-23	10.04988
SW33.Val	11-Sep-23	11.5875
SW33.Val	11-Sep-23	9.326395
SW33.Val	11-Sep-23	15.925
SW33.Val	12-Sep-23	9.052544
SW33.Val	12-Sep-23	7.19
SW33.Val	12-Sep-23	8.636667
SW33.Val	12-Sep-23	15.83125
SW33.Val	12-Sep-23	6.1125
SW33.Val	12-Sep-23	0.948597
SW33.Val	12-Sep-23	8.183333
SW33.Val	12-Sep-23	10.72236
SW33.Val	12-Sep-23	17.18333
SW33.Val	12-Sep-23	14.82111
SW33.Val	13-Sep-23	11.94667
SW33.Val	13-Sep-23	12.87323
SW33.Val	13-Sep-23	11.09091
SW33.Val	13-Sep-23	12.66168
SW33.Val	13-Sep-23	7
SW33.Val	13-Sep-23	10.29323
SW33.Val	13-Sep-23	16.56333
SW33.Val	13-Sep-23	15.04837
SW33.Val	13-Sep-23	14.81667
SW33.Val	13-Sep-23	15.75083
SW33.Val	14-Sep-23	6.955208
SW33.Val	14-Sep-23	11.8075
SW33.Val	14-Sep-23	12.54333

SW33.Val	14-Sep-23	16.9925
SW33.Val	14-Sep-23	9
SW33.Val	14-Sep-23	9.056667
SW33.Val	14-Sep-23	17.25667
SW33.Val	14-Sep-23	24.865
SW33.Val	14-Sep-23	18.67167
SW33.Val	14-Sep-23	16.21268
SW33.Val	15-Sep-23	6.94
SW33.Val	15-Sep-23	8.87156
SW33.Val	15-Sep-23	11.72833
SW33.Val	15-Sep-23	16.67167
SW33.Val	15-Sep-23	4.21491
SW33.Val	15-Sep-23	1.610879
SW33.Val	15-Sep-23	17.75602
SW33.Val	15-Sep-23	20.18568
SW33.Val	15-Sep-23	30.26094
SW33.Val	15-Sep-23	16.07
SW33.Val	16-Sep-23	15.05764
SW33.Val	16-Sep-23	10.195
SW33.Val	16-Sep-23	8.825
SW33.Val	16-Sep-23	12.66889
SW33.Val	16-Sep-23	11.12833
SW33.Val	16-Sep-23	2.855
SW33.Val	16-Sep-23	12.31579
SW33.Val	16-Sep-23	24
SW33.Val	16-Sep-23	21.505
SW33.Val	16-Sep-23	13.74229
SW33.Val	17-Sep-23	7.234362
SW33.Val	17-Sep-23	12.675
SW33.Val	17-Sep-23	12.365
SW33.Val	17-Sep-23	6.67
SW33.Val	17-Sep-23	-0.85346
SW33.Val	17-Sep-23	0.595
SW33.Val	17-Sep-23	16
SW33.Val	17-Sep-23	14.1375
SW33.Val	17-Sep-23	14.83417
SW33.Val	17-Sep-23	15.46583
SW33.Val	18-Sep-23	10.47215
SW33.Val	18-Sep-23	7.868333
SW33.Val	18-Sep-23	13.9025
SW33.Val	18-Sep-23	6.667223
SW33.Val	18-Sep-23	11.8975
SW33.Val	18-Sep-23	0.265833
SW33.Val	18-Sep-23	18.69892
SW33.Val	18-Sep-23	16.26833
SW33.Val	18-Sep-23	15
SW33.Val	19-Sep-23	17.06833
SW33.Val	19-Sep-23	17.23397
SW33.Val	19-Sep-23	11.4075
SW33.Val	19-Sep-23	15.27151
SW33.Val	19-Sep-23	7.673859
SW33.Val	19-Sep-23	-8.31667
SW33.Val	19-Sep-23	11

SW33.Val	19-Sep-23	14.83333
SW33.Val	19-Sep-23	17.86667
SW33.Val	19-Sep-23	13.33333
SW33.Val	20-Sep-23	14.46667
SW33.Val	20-Sep-23	10.06667
SW33.Val	20-Sep-23	9.806856
SW33.Val	20-Sep-23	13.26923
SW33.Val	20-Sep-23	8.329983
SW33.Val	20-Sep-23	7.066093
SW33.Val	20-Sep-23	15.26325
SW33.Val	20-Sep-23	11.56558
SW33.Val	20-Sep-23	17.19598
SW33.Val	20-Sep-23	15.66667
SW33.Val	21-Sep-23	14
SW33.Val	21-Sep-23	10.23632
SW33.Val	21-Sep-23	8.067332
SW33.Val	21-Sep-23	13.8975
SW33.Val	21-Sep-23	11.3325
SW33.Val	21-Sep-23	12.03491
SW33.Val	21-Sep-23	10.8975
SW33.Val	21-Sep-23	12.4775
SW33.Val	21-Sep-23	14.8675
SW33.Val	21-Sep-23	16.8325
SW33.Val	22-Sep-23	14
SW33.Val	22-Sep-23	15.61625
SW33.Val	22-Sep-23	15.0675
SW33.Val	22-Sep-23	17
SW33.Val	22-Sep-23	-0.6775
SW33.Val	22-Sep-23	6.097419
SW33.Val	22-Sep-23	17
SW33.Val	22-Sep-23	14.46
SW33.Val	22-Sep-23	15.73667
SW33.Val	22-Sep-23	15
SW33.Val	23-Sep-23	11
SW33.Val	23-Sep-23	8
SW33.Val	23-Sep-23	10.53449
SW33.Val	23-Sep-23	11.78816
SW33.Val	23-Sep-23	1.997494
SW33.Val	23-Sep-23	5.158333
SW33.Val	23-Sep-23	17.26606
SW33.Val	23-Sep-23	16.70075
SW33.Val	23-Sep-23	16.73601
SW33.Val	23-Sep-23	15.83153
SW33.Val	24-Sep-23	14.71857
SW33.Val	24-Sep-23	11.88311
SW33.Val	24-Sep-23	11.7995
SW33.Val	24-Sep-23	3
SW33.Val	24-Sep-23	5.0075
SW33.Val	24-Sep-23	-1.96997
SW33.Val	24-Sep-23	18.77
SW33.Val	24-Sep-23	10.29676
SW33.Val	24-Sep-23	14.60652
SW33.Val	24-Sep-23	9.922917

SW33.Val	25-Sep-23	7.4075
SW33.Val	25-Sep-23	14.07513
SW33.Val	25-Sep-23	8.860117
SW33.Val	25-Sep-23	1.884615
SW33.Val	25-Sep-23	5.99834
SW33.Val	25-Sep-23	2
SW33.Val	25-Sep-23	11.36515
SW33.Val	25-Sep-23	14
SW33.Val	25-Sep-23	11.39
SW33.Val	26-Sep-23	9.36
SW33.Val	26-Sep-23	7.41
SW33.Val	26-Sep-23	5.695761
SW33.Val	26-Sep-23	14.93
SW33.Val	26-Sep-23	0.049126
SW33.Val	26-Sep-23	-2.32668
SW33.Val	26-Sep-23	7.805486
SW33.Val	26-Sep-23	14.3375
SW33.Val	26-Sep-23	13.43108
SW33.Val	26-Sep-23	11
SW33.Val	27-Sep-23	10.425
SW33.Val	27-Sep-23	12.49
SW33.Val	27-Sep-23	9.769489
SW33.Val	27-Sep-23	13.92917
SW33.Val	27-Sep-23	4.777778
SW33.Val	27-Sep-23	-4.64583
SW33.Val	27-Sep-23	-6.76165
SW33.Val	27-Sep-23	17.92206
SW33.Val	27-Sep-23	12.57083
SW33.Val	27-Sep-23	12.6125
SW33.Val	28-Sep-23	7.37219
SW33.Val	28-Sep-23	8.591667
SW33.Val	28-Sep-23	11.14775
SW33.Val	28-Sep-23	5.478333
SW33.Val	28-Sep-23	8
SW33.Val	28-Sep-23	-4.34224
SW33.Val	28-Sep-23	6.825
SW33.Val	28-Sep-23	11.26894
SW33.Val	28-Sep-23	12.78542
SW33.Val	28-Sep-23	5.641667
SW33.Val	29-Sep-23	5.858333
SW33.Val	29-Sep-23	10.23583
SW33.Val	29-Sep-23	8.6575
SW33.Val	29-Sep-23	15.355
SW33.Val	29-Sep-23	3.54
SW33.Val	29-Sep-23	5.656667
SW33.Val	29-Sep-23	-0.93626
SW33.Val	29-Sep-23	11.27167
SW33.Val	29-Sep-23	9.570593
SW33.Val	29-Sep-23	9.255
SW33.Val	30-Sep-23	13.5851
SW33.Val	30-Sep-23	12.20651
SW33.Val	30-Sep-23	11
SW33.Val	30-Sep-23	11.565

SW33.Val	30-Sep-23	4.53
SW33.Val	30-Sep-23	2.035
SW33.Val	30-Sep-23	15.87625
SW33.Val	30-Sep-23	12.54583
SW33.Val	30-Sep-23	11
SW33.Val	30-Sep-23	10.8725
SW33.Val	01-Oct-23	5.69
SW33.Val	01-Oct-23	5.29205
SW33.Val	01-Oct-23	10.88625
SW33.Val	01-Oct-23	5.146545
SW33.Val	01-Oct-23	6.3725
SW33.Val	01-Oct-23	7.3625
SW33.Val	01-Oct-23	7.945
SW33.Val	01-Oct-23	12.18182
SW33.Val	01-Oct-23	9.854045
SW33.Val	01-Oct-23	11.3825
SW33.Val	02-Oct-23	9.96
SW33.Val	02-Oct-23	9.893333
SW33.Val	02-Oct-23	9.226667
SW33.Val	02-Oct-23	5.706667
SW33.Val	02-Oct-23	-0.48961
SW33.Val	02-Oct-23	0.686617
SW33.Val	02-Oct-23	14.81333
SW33.Val	02-Oct-23	13
SW33.Val	02-Oct-23	12.1387
SW33.Val	03-Oct-23	9.620316
SW33.Val	03-Oct-23	9.173117
SW33.Val	03-Oct-23	9.058333
SW33.Val	03-Oct-23	7.773333
SW33.Val	03-Oct-23	4.703333
SW33.Val	03-Oct-23	1.639167
SW33.Val	03-Oct-23	4.629167
SW33.Val	03-Oct-23	13.91521
SW33.Val	03-Oct-23	9.272348
SW33.Val	03-Oct-23	11
SW33.Val	04-Oct-23	7.503333
SW33.Val	04-Oct-23	10.47544
SW33.Val	04-Oct-23	9.474167
SW33.Val	04-Oct-23	7.77379
SW33.Val	04-Oct-23	0.704073
SW33.Val	04-Oct-23	-1.25323
SW33.Val	04-Oct-23	-1.9775
SW33.Val	04-Oct-23	10.97257
SW33.Val	04-Oct-23	10.825
SW33.Val	04-Oct-23	10
SW33.Val	05-Oct-23	11
SW33.Val	05-Oct-23	8.475
SW33.Val	05-Oct-23	6
SW33.Val	05-Oct-23	0.55
SW33.Val	05-Oct-23	2.15
SW33.Val	05-Oct-23	0
SW33.Val	05-Oct-23	4.133148
SW33.Val	05-Oct-23	10

SW33.Val	05-Oct-23	11.20667
SW33.Val	05-Oct-23	14
SW33.Val	06-Oct-23	10.12417
SW33.Val	06-Oct-23	9.941389
SW33.Val	06-Oct-23	14.47583
SW33.Val	06-Oct-23	9
SW33.Val	06-Oct-23	9.073425
SW33.Val	06-Oct-23	-2.12189
SW33.Val	06-Oct-23	18.06367
SW33.Val	06-Oct-23	20.90317
SW33.Val	06-Oct-23	21.1725
SW33.Val	06-Oct-23	17.57583
SW33.Val	07-Oct-23	14.58877
SW33.Val	07-Oct-23	13.93442
SW33.Val	07-Oct-23	13.42
SW33.Val	07-Oct-23	21.54333
SW33.Val	07-Oct-23	4.461667
SW33.Val	07-Oct-23	12.87655
SW33.Val	07-Oct-23	12.97243
SW33.Val	07-Oct-23	12.97667
SW33.Val	07-Oct-23	14.86184
SW33.Val	07-Oct-23	14
SW33.Val	08-Oct-23	15.12333
SW33.Val	08-Oct-23	12.17623
SW33.Val	08-Oct-23	14.56881
SW33.Val	08-Oct-23	12.43612
SW33.Val	08-Oct-23	5.696414
SW33.Val	08-Oct-23	5.249791
SW33.Val	08-Oct-23	10.35333
SW33.Val	08-Oct-23	13
SW33.Val	08-Oct-23	14
SW33.Val	08-Oct-23	16
SW33.Val	09-Oct-23	10.93875
SW33.Val	09-Oct-23	11.94763
SW33.Val	09-Oct-23	12.95587
SW33.Val	09-Oct-23	7
SW33.Val	09-Oct-23	-1.155
SW33.Val	09-Oct-23	-2.5
SW33.Val	09-Oct-23	6.897415
SW33.Val	09-Oct-23	13.97506
SW33.Val	09-Oct-23	14.27612
SW33.Val	09-Oct-23	15
SW33.Val	10-Oct-23	12.18375
SW33.Val	10-Oct-23	10.4781
SW33.Val	10-Oct-23	13.91174
SW33.Val	10-Oct-23	5.118038
SW33.Val	10-Oct-23	6.078333
SW33.Val	10-Oct-23	8.86783
SW33.Val	10-Oct-23	10.35667
SW33.Val	10-Oct-23	12.0417
SW33.Val	10-Oct-23	11.27833
SW33.Val	11-Oct-23	11.10833
SW33.Val	11-Oct-23	7.371571

SW33.Val	11-Oct-23	12.34754
SW33.Val	11-Oct-23	8.045719
SW33.Val	11-Oct-23	0.666667
SW33.Val	11-Oct-23	-0.38504
SW33.Val	11-Oct-23	1.621667
SW33.Val	11-Oct-23	13.39167
SW33.Val	11-Oct-23	10.0796
SW33.Val	11-Oct-23	15
SW33.Val	12-Oct-23	10.7375
SW33.Val	12-Oct-23	5.604167
SW33.Val	12-Oct-23	12.17917
SW33.Val	12-Oct-23	11
SW33.Val	12-Oct-23	1.895833
SW33.Val	12-Oct-23	-3.2375
SW33.Val	12-Oct-23	-2.75209
SW33.Val	12-Oct-23	10.67836
SW33.Val	12-Oct-23	9.979184
SW33.Val	12-Oct-23	8.116667
SW33.Val	13-Oct-23	15.42013
SW33.Val	13-Oct-23	13.3622
SW33.Val	13-Oct-23	12.28453
SW33.Val	13-Oct-23	10.36093
SW33.Val	13-Oct-23	-3.27982
SW33.Val	13-Oct-23	-1.59631
SW33.Val	13-Oct-23	5
SW33.Val	13-Oct-23	5.982098
SW33.Val	13-Oct-23	12
SW33.Val	13-Oct-23	12.2782
SW33.Val	14-Oct-23	12.2621
SW33.Val	14-Oct-23	11.69714
SW33.Val	14-Oct-23	10.36
SW33.Val	14-Oct-23	13.91
SW33.Val	14-Oct-23	-4.78
SW33.Val	14-Oct-23	0.600998
SW33.Val	14-Oct-23	7.379224
SW33.Val	14-Oct-23	8
SW33.Val	14-Oct-23	14.06733
SW33.Val	14-Oct-23	12.8407
SW33.Val	15-Oct-23	14.79
SW33.Val	15-Oct-23	15.7598
SW33.Val	15-Oct-23	14.29
SW33.Val	15-Oct-23	4.785134
SW33.Val	15-Oct-23	-3
SW33.Val	15-Oct-23	-3.601
SW33.Val	15-Oct-23	12.48
SW33.Val	15-Oct-23	6.679135
SW33.Val	15-Oct-23	10.01917
SW33.Val	15-Oct-23	14.28083
SW33.Val	16-Oct-23	10.41917
SW33.Val	16-Oct-23	16
SW33.Val	16-Oct-23	7.819167
SW33.Val	16-Oct-23	1.215941
SW33.Val	16-Oct-23	-4.315

SW33.Val	16-Oct-23	0.903809
SW33.Val	16-Oct-23	8.622343
SW33.Val	16-Oct-23	12
SW33.Val	16-Oct-23	13.86583
SW33.Val	16-Oct-23	12.71917
SW33.Val	17-Oct-23	15.2575
SW33.Val	17-Oct-23	10
SW33.Val	17-Oct-23	13
SW33.Val	17-Oct-23	-0.03667
SW33.Val	17-Oct-23	-2.88446
SW33.Val	17-Oct-23	-3.15243
SW33.Val	17-Oct-23	6.525396
SW33.Val	17-Oct-23	12.68167
SW33.Val	17-Oct-23	17.94495
SW33.Val	18-Oct-23	14.71833
SW33.Val	18-Oct-23	13.94556
SW33.Val	18-Oct-23	6.827644
SW33.Val	18-Oct-23	10.455
SW33.Val	18-Oct-23	1.958333
SW33.Val	18-Oct-23	-7.26417
SW33.Val	18-Oct-23	0.238095
SW33.Val	18-Oct-23	10.90058
SW33.Val	18-Oct-23	11.68167
SW33.Val	18-Oct-23	9.981636
SW33.Val	19-Oct-23	10.12667
SW33.Val	19-Oct-23	1.480956
SW33.Val	19-Oct-23	9.761244
SW33.Val	19-Oct-23	6
SW33.Val	19-Oct-23	-2.54856
SW33.Val	19-Oct-23	-13.4737
SW33.Val	19-Oct-23	-3.02244
SW33.Val	19-Oct-23	8.47
SW33.Val	19-Oct-23	11.73
SW33.Val	19-Oct-23	13.9475
SW33.Val	20-Oct-23	14.58451
SW33.Val	20-Oct-23	10.2525
SW33.Val	20-Oct-23	12
SW33.Val	20-Oct-23	4.957482
SW33.Val	20-Oct-23	0.080402
SW33.Val	20-Oct-23	-7
SW33.Val	20-Oct-23	5.67
SW33.Val	20-Oct-23	10.61683
SW33.Val	20-Oct-23	6.9525
SW33.Val	20-Oct-23	13.95
SW33.Val	21-Oct-23	10.33195
SW33.Val	21-Oct-23	11.95238
SW33.Val	21-Oct-23	11.17955
SW33.Val	21-Oct-23	5.816667
SW33.Val	21-Oct-23	-2
SW33.Val	21-Oct-23	-3.21776
SW33.Val	21-Oct-23	3.5
SW33.Val	21-Oct-23	12
SW33.Val	21-Oct-23	14

SW33.Val	21-Oct-23	11.98333
SW33.Val	22-Oct-23	9.567139
SW33.Val	22-Oct-23	8.5
SW33.Val	22-Oct-23	8.527778
SW33.Val	22-Oct-23	6
SW33.Val	22-Oct-23	-11
SW33.Val	22-Oct-23	-4.5478
SW33.Val	22-Oct-23	6.751244
SW33.Val	22-Oct-23	10.85
SW33.Val	22-Oct-23	10.70421
SW33.Val	22-Oct-23	10.07917
SW33.Val	23-Oct-23	9.1475
SW33.Val	23-Oct-23	11.41583
SW33.Val	23-Oct-23	6.118038
SW33.Val	23-Oct-23	5.636667
SW33.Val	23-Oct-23	-7.58498
SW33.Val	23-Oct-23	-1.32746
SW33.Val	23-Oct-23	6.71137
SW33.Val	23-Oct-23	9.8475
SW33.Val	23-Oct-23	12.0525
SW33.Val	23-Oct-23	10.98417
SW33.Val	24-Oct-23	10
SW33.Val	24-Oct-23	10
SW33.Val	24-Oct-23	9.961389
SW33.Val	24-Oct-23	-5
SW33.Val	24-Oct-23	-11.5195
SW33.Val	24-Oct-23	-6.65337
SW33.Val	24-Oct-23	8.589167
SW33.Val	24-Oct-23	8.617377
SW33.Val	24-Oct-23	8.412303
SW33.Val	25-Oct-23	11
SW33.Val	25-Oct-23	11.285
SW33.Val	25-Oct-23	8.919435
SW33.Val	25-Oct-23	3.1175
SW33.Val	25-Oct-23	-1
SW33.Val	25-Oct-23	-7.485
SW33.Val	25-Oct-23	-1.37688
SW33.Val	25-Oct-23	13.34
SW33.Val	25-Oct-23	11.15212
SW33.Val	25-Oct-23	6.947368
SW33.Val	26-Oct-23	9.5225
SW33.Val	26-Oct-23	9.283445
SW33.Val	26-Oct-23	5.491228
SW33.Val	26-Oct-23	5
SW33.Val	26-Oct-23	-0.0375
SW33.Val	26-Oct-23	-4.82736
SW33.Val	26-Oct-23	-0.43464
SW33.Val	26-Oct-23	5.866433
SW33.Val	26-Oct-23	11.38385
SW33.Val	26-Oct-23	10.48667
SW33.Val	27-Oct-23	8
SW33.Val	27-Oct-23	10.80944
SW33.Val	27-Oct-23	9.976389

SW33.Val	27-Oct-23	9.059509
SW33.Val	27-Oct-23	-3.54167
SW33.Val	27-Oct-23	-1.06425
SW33.Val	27-Oct-23	5.590492
SW33.Val	27-Oct-23	7.081803
SW33.Val	27-Oct-23	11.8425
SW33.Val	27-Oct-23	9.685619
SW33.Val	28-Oct-23	10.9335
SW33.Val	28-Oct-23	9.719434
SW33.Val	28-Oct-23	8.508306
SW33.Val	28-Oct-23	12.20468
SW33.Val	28-Oct-23	-5.62667
SW33.Val	28-Oct-23	-7.73
SW33.Val	28-Oct-23	3.933333
SW33.Val	28-Oct-23	3.086667
SW33.Val	28-Oct-23	8.226667
SW33.Val	28-Oct-23	4.191507
SW33.Val	29-Oct-23	5.984962
SW33.Val	29-Oct-23	4.140241
SW33.Val	29-Oct-23	0.925895
SW33.Val	29-Oct-23	1.117012
SW33.Val	29-Oct-23	-16.9467
SW33.Val	29-Oct-23	-6.51575
SW33.Val	29-Oct-23	6.004444
SW33.Val	29-Oct-23	8
SW33.Val	29-Oct-23	4.77193
SW33.Val	29-Oct-23	10
SW33.Val	30-Oct-23	6.058382
SW33.Val	30-Oct-23	7.1975
SW33.Val	30-Oct-23	-1.10566
SW33.Val	30-Oct-23	-2.1406
SW33.Val	30-Oct-23	-4.25
SW33.Val	30-Oct-23	-8.0603
SW33.Val	30-Oct-23	4.424497
SW33.Val	30-Oct-23	12.54182
SW33.Val	30-Oct-23	8.45614
SW33.Val	30-Oct-23	9.253133
SW33.Val	31-Oct-23	11.02333
SW33.Val	31-Oct-23	2.504583
SW33.Val	31-Oct-23	2.936508
SW33.Val	31-Oct-23	-1.03219
SW33.Val	31-Oct-23	-5.5582
SW33.Val	31-Oct-23	-2.75708
SW33.Val	31-Oct-23	8.029167
SW33.Val	31-Oct-23	15.65667
SW33.Val	31-Oct-23	8.611667
SW33.Val	31-Oct-23	9.868443
SW33.Val	01-Nov-23	7.065054
SW33.Val	01-Nov-23	5.738986
SW33.Val	01-Nov-23	8.827155
SW33.Val	01-Nov-23	-0.76981
SW33.Val	01-Nov-23	-4.06805
SW33.Val	01-Nov-23	1.669028

SW33.Val	01-Nov-23	12.03667
SW33.Val	01-Nov-23	11.73272
SW33.Val	01-Nov-23	10.16597
SW33.Val	02-Nov-23	10.3749
SW33.Val	02-Nov-23	6.472917
SW33.Val	02-Nov-23	8.289167
SW33.Val	02-Nov-23	0.824605
SW33.Val	02-Nov-23	5.778333
SW33.Val	02-Nov-23	2.76
SW33.Val	02-Nov-23	2.427144
SW33.Val	02-Nov-23	2.851205
SW33.Val	02-Nov-23	4.91
SW33.Val	02-Nov-23	5.975
SW33.Val	03-Nov-23	5.17
SW33.Val	03-Nov-23	4.01
SW33.Val	03-Nov-23	8.421707
SW33.Val	03-Nov-23	1.7725
SW33.Val	03-Nov-23	-1
SW33.Val	03-Nov-23	5.12782
SW33.Val	03-Nov-23	3
SW33.Val	03-Nov-23	7.629073
SW33.Val	03-Nov-23	10.81833
SW33.Val	03-Nov-23	8.218333
SW33.Val	04-Nov-23	3.454167
SW33.Val	04-Nov-23	8.020807
SW33.Val	04-Nov-23	9.71273
SW33.Val	04-Nov-23	7.409167
SW33.Val	04-Nov-23	-0.54598
SW33.Val	04-Nov-23	-4
SW33.Val	04-Nov-23	-1.05254
SW33.Val	04-Nov-23	3.838223
SW33.Val	04-Nov-23	10.825
SW33.Val	04-Nov-23	16.175
SW33.Val	05-Nov-23	11.0362
SW33.Val	05-Nov-23	9.03
SW33.Val	05-Nov-23	2.75
SW33.Val	05-Nov-23	3.815987
SW33.Val	05-Nov-23	-5.06389
SW33.Val	05-Nov-23	2.341667
SW33.Val	05-Nov-23	6.980785
SW33.Val	05-Nov-23	12.63151
SW33.Val	05-Nov-23	5
SW33.Val	05-Nov-23	7.433915
SW33.Val	06-Nov-23	8.9225
SW33.Val	06-Nov-23	5.02995
SW33.Val	06-Nov-23	10.7075
SW33.Val	06-Nov-23	0.113011
SW33.Val	06-Nov-23	-3.66223
SW33.Val	06-Nov-23	-2.06667
SW33.Val	06-Nov-23	1
SW33.Val	06-Nov-23	0.826667
SW33.Val	06-Nov-23	6.906667
SW33.Val	06-Nov-23	2.819016

SW33.Val	07-Nov-23	2.933333
SW33.Val	07-Nov-23	4.005838
SW33.Val	07-Nov-23	-5.94667
SW33.Val	07-Nov-23	-10.1738
SW33.Val	07-Nov-23	-13.0475
SW33.Val	07-Nov-23	2.967473
SW33.Val	07-Nov-23	3.516236
SW33.Val	07-Nov-23	1.058333
SW33.Val	07-Nov-23	-0.90583
SW33.Val	07-Nov-23	4.786367
SW33.Val	08-Nov-23	5.223333
SW33.Val	08-Nov-23	-6.92417
SW33.Val	08-Nov-23	-4.29417
SW33.Val	08-Nov-23	3.735
SW33.Val	08-Nov-23	-0.78982
SW33.Val	08-Nov-23	-7.05
SW33.Val	08-Nov-23	-0.04
SW33.Val	08-Nov-23	-2.155
SW33.Val	08-Nov-23	-4.28524
SW33.Val	09-Nov-23	-2.18599
SW33.Val	09-Nov-23	-1.7414
SW33.Val	09-Nov-23	-0.9799
SW33.Val	09-Nov-23	-7.41402
SW33.Val	09-Nov-23	-14.8091
SW33.Val	09-Nov-23	-22.6458
SW33.Val	09-Nov-23	-12.9194
SW33.Val	09-Nov-23	-12.7349
SW33.Val	09-Nov-23	-12.5504
SW33.Val	09-Nov-23	-12.3659
SW33.Val	10-Nov-23	-12.1814
SW33.Val	10-Nov-23	-11.997
SW33.Val	10-Nov-23	-11.8125
SW33.Val	10-Nov-23	-11.628
SW33.Val	10-Nov-23	-11.4435
SW33.Val	10-Nov-23	-11.259
SW33.Val	10-Nov-23	-11.0745
SW33.Val	10-Nov-23	-10.8901
SW33.Val	10-Nov-23	-10.7056
SW33.Val	10-Nov-23	-10.5211
SW33.Val	11-Nov-23	-10.3366
SW33.Val	11-Nov-23	-10.1521
SW33.Val	11-Nov-23	-9.96766
SW33.Val	11-Nov-23	-9.78318
SW33.Val	11-Nov-23	-9.5987
SW33.Val	11-Nov-23	-9.41421
SW33.Val	11-Nov-23	-9.22973
SW33.Val	11-Nov-23	-9.04525
SW33.Val	11-Nov-23	-8.86077
SW33.Val	11-Nov-23	-8.67629
SW33.Val	12-Nov-23	-8.49181
SW33.Val	12-Nov-23	-8.30732
SW33.Val	12-Nov-23	-8.12284
SW33.Val	12-Nov-23	-7.93836

SW33.Val	12-Nov-23	-7.75388
SW33.Val	12-Nov-23	-7.5694
SW33.Val	12-Nov-23	-7.38492
SW33.Val	12-Nov-23	-7.20044
SW33.Val	12-Nov-23	-7.01595
SW33.Val	12-Nov-23	-6.83147
SW33.Val	13-Nov-23	-6.64699
SW33.Val	13-Nov-23	-6.46251
SW33.Val	13-Nov-23	-6.27803
SW33.Val	13-Nov-23	-6.09355
SW33.Val	13-Nov-23	-2.40167
SW33.Val	13-Nov-23	-10.5311
SW33.Val	13-Nov-23	4.791355
SW33.Val	13-Nov-23	12.50833
SW33.Val	13-Nov-23	12.19333
SW33.Val	13-Nov-23	11.295
SW33.Val	14-Nov-23	10.2073
SW33.Val	14-Nov-23	5.301667
SW33.Val	14-Nov-23	-1.99334
SW33.Val	14-Nov-23	-1.895
SW33.Val	14-Nov-23	-9.59583
SW33.Val	14-Nov-23	-10.1063
SW33.Val	14-Nov-23	4.465556
SW33.Val	14-Nov-23	9.011696
SW33.Val	14-Nov-23	9.822554
SW33.Val	14-Nov-23	10
SW33.Val	15-Nov-23	11
SW33.Val	15-Nov-23	14.20938
SW33.Val	15-Nov-23	7.333194
SW33.Val	15-Nov-23	-6.41019
SW33.Val	15-Nov-23	-8.70094
SW33.Val	15-Nov-23	-1.90033
SW33.Val	15-Nov-23	7.645215
SW33.Val	15-Nov-23	11.49792
SW33.Val	15-Nov-23	14.81131
SW33.Val	16-Nov-23	13.49583
SW33.Val	16-Nov-23	17.799
SW33.Val	16-Nov-23	17.30025
SW33.Val	16-Nov-23	6
SW33.Val	16-Nov-23	-2.59074
SW33.Val	16-Nov-23	-7.29905
SW33.Val	16-Nov-23	-2.50139
SW33.Val	16-Nov-23	9.597998
SW33.Val	16-Nov-23	12.49944
SW33.Val	16-Nov-23	15.59799
SW33.Val	17-Nov-23	12
SW33.Val	17-Nov-23	15.40602
SW33.Val	17-Nov-23	10.80301
SW33.Val	17-Nov-23	8
SW33.Val	17-Nov-23	1
SW33.Val	17-Nov-23	-1.99917
SW33.Val	17-Nov-23	7.727182
SW33.Val	17-Nov-23	7.8

SW33.Val	17-Nov-23	20.48957
SW33.Val	17-Nov-23	21.3995
SW33.Val	18-Nov-23	15.97524
SW33.Val	18-Nov-23	4.396667
SW33.Val	18-Nov-23	5.44875
SW33.Val	18-Nov-23	13.99917
SW33.Val	18-Nov-23	0.700459
SW33.Val	18-Nov-23	-3.09875
SW33.Val	18-Nov-23	9.603664
SW33.Val	18-Nov-23	15.79833
SW33.Val	18-Nov-23	17.99667
SW33.Val	18-Nov-23	15
SW33.Val	19-Nov-23	13.20333
SW33.Val	19-Nov-23	19.19667
SW33.Val	19-Nov-23	17
SW33.Val	19-Nov-23	9.005
SW33.Val	19-Nov-23	12.34902
SW33.Val	19-Nov-23	15.59
SW33.Val	19-Nov-23	7.90201
SW33.Val	19-Nov-23	12.38949
SW33.Val	19-Nov-23	22.99
SW33.Val	19-Nov-23	17.1975
SW33.Val	20-Nov-23	17.10331
SW33.Val	20-Nov-23	19.79
SW33.Val	20-Nov-23	11.89526
SW33.Val	20-Nov-23	11.33454
SW33.Val	20-Nov-23	6.696667
SW33.Val	20-Nov-23	0
SW33.Val	20-Nov-23	4.903849
SW33.Val	20-Nov-23	12.8
SW33.Val	20-Nov-23	10.50333
SW33.Val	20-Nov-23	6.791355
SW33.Val	21-Nov-23	9
SW33.Val	21-Nov-23	9.640534
SW33.Val	21-Nov-23	3.780386
SW33.Val	21-Nov-23	-3.01251
SW33.Val	21-Nov-23	-0.39051
SW33.Val	21-Nov-23	4.19202
SW33.Val	21-Nov-23	4.904167
SW33.Val	21-Nov-23	13
SW33.Val	21-Nov-23	16.01338
SW33.Val	21-Nov-23	12.60599
SW33.Val	22-Nov-23	14.895
SW33.Val	22-Nov-23	18.5975
SW33.Val	22-Nov-23	6.885
SW33.Val	22-Nov-23	2.982456
SW33.Val	22-Nov-23	-4.55537
SW33.Val	22-Nov-23	5.709409
SW33.Val	22-Nov-23	15.43
SW33.Val	22-Nov-23	16.20367
SW33.Val	22-Nov-23	9
SW33.Val	22-Nov-23	12.22333
SW33.Val	23-Nov-23	10.10583

SW33.Val	23-Nov-23	12.18833
SW33.Val	23-Nov-23	6
SW33.Val	23-Nov-23	-1.00583
SW33.Val	23-Nov-23	-4.83847
SW33.Val	23-Nov-23	-1.803
SW33.Val	23-Nov-23	10.71977
SW33.Val	23-Nov-23	22
SW33.Val	23-Nov-23	20.97839
SW33.Val	24-Nov-23	18.58
SW33.Val	24-Nov-23	18.8936
SW33.Val	24-Nov-23	20.59333
SW33.Val	24-Nov-23	15
SW33.Val	24-Nov-23	7.629619
SW33.Val	24-Nov-23	7
SW33.Val	24-Nov-23	12.78667
SW33.Val	24-Nov-23	10
SW33.Val	24-Nov-23	12.2075
SW33.Val	24-Nov-23	13
SW33.Val	25-Nov-23	10.1925
SW33.Val	25-Nov-23	10.67527
SW33.Val	25-Nov-23	10.37
SW33.Val	25-Nov-23	4.882793
SW33.Val	25-Nov-23	1.966667
SW33.Val	25-Nov-23	5.172917
SW33.Val	25-Nov-23	7.78727
SW33.Val	25-Nov-23	10.95411
SW33.Val	25-Nov-23	9.834028
SW33.Val	25-Nov-23	14.49126
SW33.Val	26-Nov-23	9.766028
SW33.Val	26-Nov-23	14.345
SW33.Val	26-Nov-23	12.81765
SW33.Val	26-Nov-23	8.291719
SW33.Val	26-Nov-23	2.477083
SW33.Val	26-Nov-23	6.412222
SW33.Val	26-Nov-23	13.64589
SW33.Val	26-Nov-23	15.8194
SW33.Val	26-Nov-23	14.41729
SW33.Val	26-Nov-23	14.0383
SW33.Val	27-Nov-23	14.19
SW33.Val	27-Nov-23	15
SW33.Val	27-Nov-23	15.23
SW33.Val	27-Nov-23	5.855
SW33.Val	27-Nov-23	6.978351
SW33.Val	27-Nov-23	14.23691
SW33.Val	27-Nov-23	17
SW33.Val	27-Nov-23	13.08917
SW33.Val	27-Nov-23	10
SW33.Val	27-Nov-23	15.50833
SW33.Val	28-Nov-23	14
SW33.Val	28-Nov-23	13.55887
SW33.Val	28-Nov-23	12.51898
SW33.Val	28-Nov-23	7
SW33.Val	28-Nov-23	17.01083

SW33.Val	28-Nov-23	71.51894
SW33.Val	28-Nov-23	36.47748
SW33.Val	28-Nov-23	1.436018
SW33.Val	28-Nov-23	7.053566
SW33.Val	28-Nov-23	7.342786
SW33.Val	29-Nov-23	6.562969
SW33.Val	29-Nov-23	5.277917
SW33.Val	29-Nov-23	3.353
SW33.Val	29-Nov-23	-1.40328
SW33.Val	29-Nov-23	-11.0255
SW33.Val	29-Nov-23	-10.9513
SW33.Val	29-Nov-23	10.18444
SW33.Val	29-Nov-23	16.72388
SW33.Val	29-Nov-23	16.07
SW33.Val	29-Nov-23	15.48814
SW33.Val	30-Nov-23	13.1875
SW33.Val	30-Nov-23	6.9
SW33.Val	30-Nov-23	3.2375
SW33.Val	30-Nov-23	-8.86288
SW33.Val	30-Nov-23	-1.99183
SW33.Val	30-Nov-23	5.310604
SW33.Val	30-Nov-23	14.225
SW33.Val	30-Nov-23	6
SW33.Val	30-Nov-23	11.21
SW33.Val	01-Dec-23	15.50396
SW33.Val	01-Dec-23	13.70315
SW33.Val	01-Dec-23	13.34728
SW33.Val	01-Dec-23	15.93849
SW33.Val	01-Dec-23	12.02831
SW33.Val	01-Dec-23	12.10462
SW33.Val	01-Dec-23	12.18093
SW33.Val	01-Dec-23	12.25723
SW33.Val	01-Dec-23	12.33354
SW33.Val	01-Dec-23	12.40985
SW33.Val	02-Dec-23	12.48616
SW33.Val	02-Dec-23	12.56247
SW33.Val	02-Dec-23	12.63877
SW33.Val	02-Dec-23	12.71508
SW33.Val	02-Dec-23	12.79139
SW33.Val	02-Dec-23	12.8677
SW33.Val	02-Dec-23	12.94401
SW33.Val	02-Dec-23	13.02031
SW33.Val	02-Dec-23	13.09662
SW33.Val	02-Dec-23	13.17293
SW33.Val	03-Dec-23	13.24924
SW33.Val	03-Dec-23	13.32555
SW33.Val	03-Dec-23	13.40185
SW33.Val	03-Dec-23	13.47816
SW33.Val	03-Dec-23	13.55447
SW33.Val	03-Dec-23	13.63078
SW33.Val	03-Dec-23	13.70709
SW33.Val	03-Dec-23	13.78339
SW33.Val	03-Dec-23	13.8597

SW33.Val	03-Dec-23	13.93601
SW33.Val	04-Dec-23	14.01232
SW33.Val	04-Dec-23	14.08863
SW33.Val	04-Dec-23	14.16493
SW33.Val	04-Dec-23	14.24124
SW33.Val	04-Dec-23	14.31755
SW33.Val	04-Dec-23	14.39386
SW33.Val	04-Dec-23	14.47016
SW33.Val	04-Dec-23	14.54647
SW33.Val	04-Dec-23	14.62278
SW33.Val	04-Dec-23	14.69909
SW33.Val	05-Dec-23	14.7754
SW33.Val	05-Dec-23	14.8517
SW33.Val	05-Dec-23	14.92801
SW33.Val	05-Dec-23	13.76
SW33.Val	05-Dec-23	8.001663
SW33.Val	05-Dec-23	7.968333
SW33.Val	05-Dec-23	13
SW33.Val	05-Dec-23	19
SW33.Val	05-Dec-23	25.63861
SW33.Val	05-Dec-23	26.13667
SW33.Val	06-Dec-23	18.42083
SW33.Val	06-Dec-23	25.71083
SW33.Val	06-Dec-23	20.62778
SW33.Val	06-Dec-23	-1.67836
SW33.Val	06-Dec-23	-6.14083
SW33.Val	06-Dec-23	-17.045
SW33.Val	06-Dec-23	9.256475
SW33.Val	06-Dec-23	16.93615
SW33.Val	06-Dec-23	18.7475
SW33.Val	06-Dec-23	19.65
SW33.Val	07-Dec-23	23.42881
SW33.Val	07-Dec-23	23.73333
SW33.Val	07-Dec-23	20.1625
SW33.Val	07-Dec-23	0.916667
SW33.Val	07-Dec-23	-7.00083
SW33.Val	07-Dec-23	-20.8918
SW33.Val	07-Dec-23	8.37034
SW33.Val	07-Dec-23	18.45896
SW33.Val	07-Dec-23	21.66583
SW33.Val	08-Dec-23	20.13333
SW33.Val	08-Dec-23	24.105
SW33.Val	08-Dec-23	21.18333
SW33.Val	08-Dec-23	26.31944
SW33.Val	08-Dec-23	-3.50623
SW33.Val	08-Dec-23	-8.45
SW33.Val	08-Dec-23	-4.64444
SW33.Val	08-Dec-23	13.26711
SW33.Val	08-Dec-23	23.7
SW33.Val	08-Dec-23	30.66667
SW33.Val	09-Dec-23	29.91576
SW33.Val	09-Dec-23	24.03414
SW33.Val	09-Dec-23	30.62926

SW33.Val	09-Dec-23	24
SW33.Val	09-Dec-23	-3
SW33.Val	09-Dec-23	-11.7125
SW33.Val	09-Dec-23	7.071011
SW33.Val	09-Dec-23	20.73106
SW33.Val	09-Dec-23	24.45054
SW33.Val	09-Dec-23	28.16514
SW33.Val	10-Dec-23	27
SW33.Val	10-Dec-23	21.4475
SW33.Val	10-Dec-23	27.1825
SW33.Val	10-Dec-23	17.76617
SW33.Val	10-Dec-23	1.34
SW33.Val	10-Dec-23	-9.45113
SW33.Val	10-Dec-23	6.605757
SW33.Val	10-Dec-23	20.6825
SW33.Val	10-Dec-23	26
SW33.Val	10-Dec-23	28.91294
SW33.Val	11-Dec-23	28.87
SW33.Val	11-Dec-23	27
SW33.Val	11-Dec-23	31.9125
SW33.Val	11-Dec-23	20.92113
SW33.Val	11-Dec-23	15.58167
SW33.Val	11-Dec-23	4.357113
SW33.Val	11-Dec-23	11.01833
SW33.Val	11-Dec-23	23.31675
SW33.Val	11-Dec-23	25.61738
SW33.Val	11-Dec-23	26.2448
SW33.Val	12-Dec-23	27
SW33.Val	12-Dec-23	28.59367
SW33.Val	12-Dec-23	33.09548
SW33.Val	12-Dec-23	37.68917
SW33.Val	12-Dec-23	15.49169
SW33.Val	12-Dec-23	1.814321
SW33.Val	12-Dec-23	16.05627
SW33.Val	12-Dec-23	24.31667
SW33.Val	12-Dec-23	27
SW33.Val	12-Dec-23	28
SW33.Val	13-Dec-23	26.78033
SW33.Val	13-Dec-23	27.4425
SW33.Val	13-Dec-23	33.54606
SW33.Val	13-Dec-23	25.23833
SW33.Val	13-Dec-23	3.095833
SW33.Val	13-Dec-23	-3.7477
SW33.Val	13-Dec-23	16.07993
SW33.Val	13-Dec-23	25.31973
SW33.Val	13-Dec-23	27.38083
SW33.Val	13-Dec-23	29
SW33.Val	14-Dec-23	34.34
SW33.Val	14-Dec-23	38.28
SW33.Val	14-Dec-23	23.3647
SW33.Val	14-Dec-23	8.28
SW33.Val	14-Dec-23	-5.07
SW33.Val	14-Dec-23	0.560467

SW33.Val	14-Dec-23	14.98082
SW33.Val	14-Dec-23	27.44
SW33.Val	14-Dec-23	26.38
SW33.Val	15-Dec-23	23.92
SW33.Val	15-Dec-23	21.32
SW33.Val	15-Dec-23	25.4798
SW33.Val	15-Dec-23	20.63591
SW33.Val	15-Dec-23	12.03654
SW33.Val	15-Dec-23	-3.29815
SW33.Val	15-Dec-23	7.437604
SW33.Val	15-Dec-23	17.96491
SW33.Val	15-Dec-23	24.32
SW33.Val	15-Dec-23	22.38063
SW33.Val	16-Dec-23	26
SW33.Val	16-Dec-23	25
SW33.Val	16-Dec-23	23.87261
SW33.Val	16-Dec-23	16.74583
SW33.Val	16-Dec-23	5.879167
SW33.Val	16-Dec-23	2.420833
SW33.Val	16-Dec-23	13.31458
SW33.Val	16-Dec-23	28.07352
SW33.Val	16-Dec-23	37.75229
SW33.Val	16-Dec-23	33.1394
SW33.Val	17-Dec-23	23.48878
SW33.Val	17-Dec-23	9.520833
SW33.Val	17-Dec-23	29.91493
SW33.Val	17-Dec-23	5.993333
SW33.Val	17-Dec-23	-14.1041
SW33.Val	17-Dec-23	-16.7833
SW33.Val	17-Dec-23	12.35881
SW33.Val	17-Dec-23	29.97835
SW33.Val	17-Dec-23	23.4411
SW33.Val	17-Dec-23	5.865
SW33.Val	18-Dec-23	5.689741
SW33.Val	18-Dec-23	28.69327
SW33.Val	18-Dec-23	0.040936
SW33.Val	18-Dec-23	3.058285
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SW33.Val	18-Dec-23	18.35549
SW33.Val	18-Dec-23	33.1623
SW33.Val	18-Dec-23	10
SW33.Val	18-Dec-23	30.525
SW33.Val	18-Dec-23	17.77083
SW33.Val	19-Dec-23	13.68053
SW33.Val	19-Dec-23	31.56608
SW33.Val	19-Dec-23	14.21197
SW33.Val	19-Dec-23	0.9525
SW33.Val	19-Dec-23	18.225
SW33.Val	19-Dec-23	33.04988
SW33.Val	19-Dec-23	6.978777
SW33.Val	19-Dec-23	15.0225
SW33.Val	19-Dec-23	33.39599
SW33.Val	19-Dec-23	14.98

SW33.Val	20-Dec-23	13.399
SW33.Val	20-Dec-23	13.56
SW33.Val	20-Dec-23	22.98542
SW33.Val	20-Dec-23	35.71
SW33.Val	20-Dec-23	2.3275
SW33.Val	20-Dec-23	20.535
SW33.Val	20-Dec-23	14.07232
SW33.Val	20-Dec-23	20.18045
SW33.Val	20-Dec-23	32.35
SW33.Val	20-Dec-23	41
SW33.Val	21-Dec-23	36.92333
SW33.Val	21-Dec-23	61.78392
SW33.Val	21-Dec-23	38.57119
SW33.Val	21-Dec-23	47.57596
SW33.Val	21-Dec-23	204.4729
SW33.Val	21-Dec-23	202.6563
SW33.Val	21-Dec-23	200.8398
SW33.Val	21-Dec-23	199.0233
SW33.Val	21-Dec-23	197.2067
SW33.Val	21-Dec-23	195.3902
SW33.Val	22-Dec-23	193.5737
SW33.Val	22-Dec-23	191.7571
SW33.Val	22-Dec-23	189.9406
SW33.Val	22-Dec-23	188.1241
SW33.Val	22-Dec-23	186.3075
SW33.Val	22-Dec-23	184.491
SW33.Val	22-Dec-23	182.6745
SW33.Val	22-Dec-23	180.8579
SW33.Val	22-Dec-23	179.0414
SW33.Val	23-Dec-23	177.2249
SW33.Val	23-Dec-23	175.4083
SW33.Val	23-Dec-23	173.5918
SW33.Val	23-Dec-23	171.7753
SW33.Val	23-Dec-23	169.9587
SW33.Val	23-Dec-23	168.1422
SW33.Val	23-Dec-23	166.3256
SW33.Val	23-Dec-23	164.5091
SW33.Val	23-Dec-23	162.6926
SW33.Val	23-Dec-23	160.876
SW33.Val	24-Dec-23	159.0595
SW33.Val	24-Dec-23	157.243
SW33.Val	24-Dec-23	155.4264
SW33.Val	24-Dec-23	153.6099
SW33.Val	24-Dec-23	151.7934
SW33.Val	24-Dec-23	149.9768
SW33.Val	24-Dec-23	148.1603
SW33.Val	24-Dec-23	146.3438
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SW33.Val	24-Dec-23	142.7107
SW33.Val	25-Dec-23	140.8942
SW33.Val	25-Dec-23	139.0776
SW33.Val	25-Dec-23	137.2611
SW33.Val	25-Dec-23	135.4446

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SW33.Valı	25-Dec-23	131.8115
SW33.Valı	25-Dec-23	129.995
SW33.Valı	25-Dec-23	128.1784
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SW33.Valı	25-Dec-23	124.5454
SW33.Valı	26-Dec-23	122.7288
SW33.Valı	26-Dec-23	120.9123
SW33.Valı	26-Dec-23	119.0958
SW33.Valı	26-Dec-23	117.2792
SW33.Valı	26-Dec-23	115.4627
SW33.Valı	26-Dec-23	113.6461
SW33.Valı	26-Dec-23	111.8296
SW33.Valı	26-Dec-23	110.0131
SW33.Valı	26-Dec-23	108.1965
SW33.Valı	26-Dec-23	106.38
SW33.Valı	27-Dec-23	104.5635
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SW33.Valı	27-Dec-23	93.66427
SW33.Valı	27-Dec-23	91.84773
SW33.Valı	27-Dec-23	90.0312
SW33.Valı	27-Dec-23	88.21466
SW33.Valı	28-Dec-23	86.39813
SW33.Valı	28-Dec-23	84.5816
SW33.Valı	28-Dec-23	82.76506
SW33.Valı	28-Dec-23	80.94853
SW33.Valı	28-Dec-23	79.13199
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SW33.Valı	28-Dec-23	71.86585
SW33.Valı	28-Dec-23	70.04932
SW33.Valı	29-Dec-23	68.23278
SW33.Valı	29-Dec-23	66.41625
SW33.Valı	29-Dec-23	64.59972
SW33.Valı	29-Dec-23	62.78318
SW33.Valı	29-Dec-23	60.96665
SW33.Valı	29-Dec-23	59.15011
SW33.Valı	29-Dec-23	57.33358
SW33.Valı	29-Dec-23	55.51704
SW33.Valı	29-Dec-23	53.70051
SW33.Valı	30-Dec-23	51.88397
SW33.Valı	30-Dec-23	50.06744
SW33.Valı	30-Dec-23	48.25091
SW33.Valı	30-Dec-23	46.43437
SW33.Valı	30-Dec-23	44.61784
SW33.Valı	30-Dec-23	42.8013
SW33.Valı	30-Dec-23	40.98477
SW33.Valı	30-Dec-23	39.16823

SW33.Val	30-Dec-23	37.3517
SW33.Val	30-Dec-23	35.53516
SW33.Val	31-Dec-23	33.71863
SW33.Val	31-Dec-23	31.90209
SW33.Val	31-Dec-23	30.08556
SW33.Val	31-Dec-23	28.26903
SW33.Val	31-Dec-23	26.45249
SW33.Val	31-Dec-23	24.63596
SW33.Val	31-Dec-23	22.81942
SW33.Val	31-Dec-23	21.00289
SW33.Val	31-Dec-23	19.18635
SW33.Val	31-Dec-23	17.36982
SW33.Val	01-Jan-24	15.55328
SW33.Val	01-Jan-24	13.73675
SW33.Val	01-Jan-24	11.92022
SW33.Val	01-Jan-24	10.10368
SW33.Val	01-Jan-24	8.287146
SW33.Val	01-Jan-24	6.470612
SW33.Val	01-Jan-24	4.654077
SW33.Val	01-Jan-24	2.837543
SW33.Val	01-Jan-24	1.021008
SW33.Val	01-Jan-24	-0.79553
SW33.Val	02-Jan-24	-2.61206
SW33.Val	02-Jan-24	-4.4286
SW33.Val	02-Jan-24	-6.24513
SW33.Val	02-Jan-24	-8.06166
SW33.Val	02-Jan-24	3.424544
SW33.Val	02-Jan-24	-7.82536
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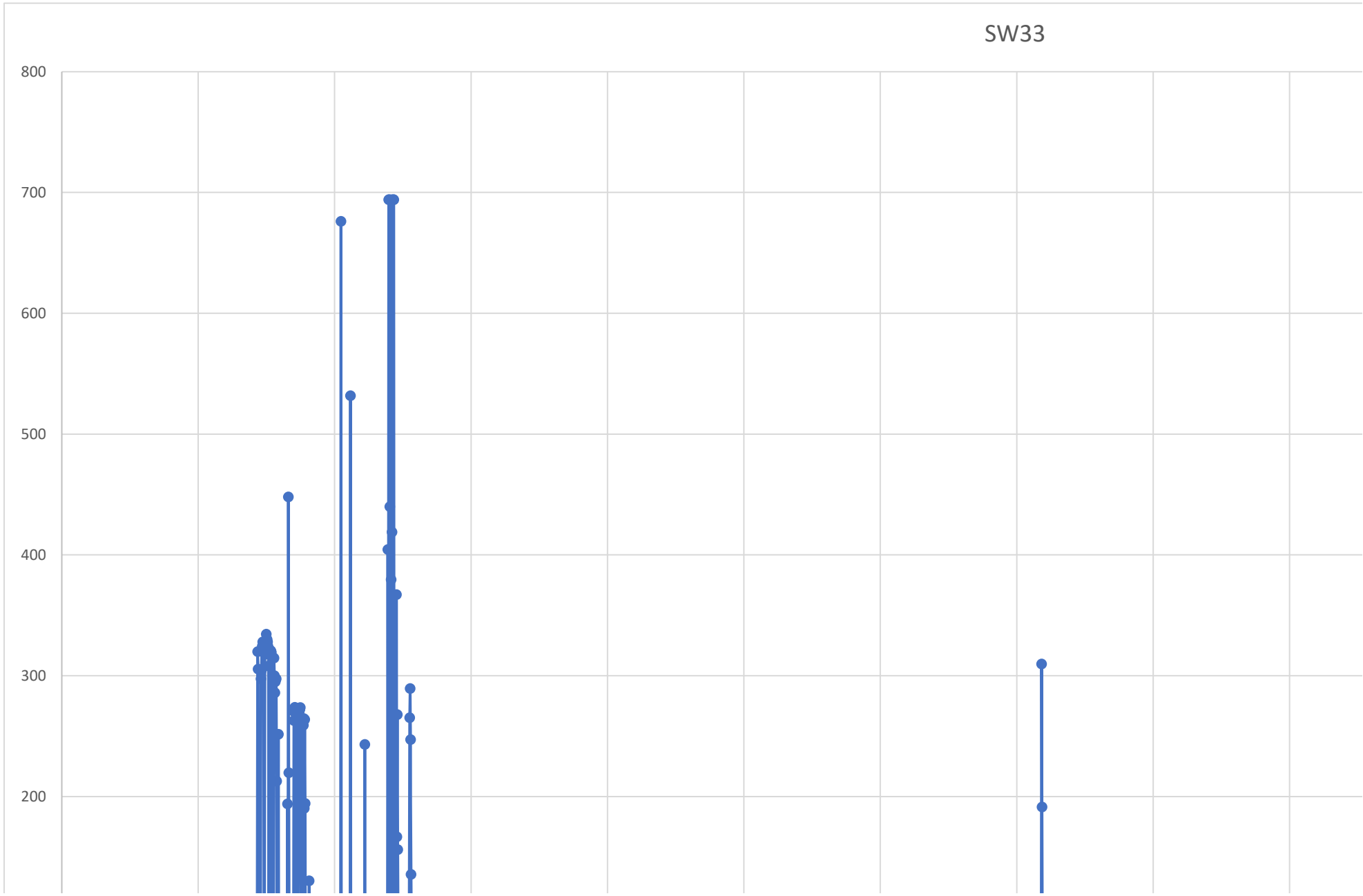
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SW33
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